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Two-Dimensional Wind Tunnel Test of an Oscillating Rotor Airfoil

Volume II

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**Two-Dimensional Wind Tunnel
Test of an Oscillating
Rotor Airfoil
Volume II**

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Philadelphia, Pennsylvania**

**Prepared for
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CONTENTS

SUMMARY	1
LIST OF SYMBOLS	1
SUMMARY OF QUASI-STEADY CONDITIONS	3
SUMMARY OF OSCILLATORY CONDITIONS	5
SUMMARY OF MODEL CHARACTERISTICS	10
QUASI-STEADY DATA	
1.0 Floor and Ceiling with 4.9% Porosity	
1.1 Pressure Coefficients and Integrated Loads . .	11
1.2 Drag	47
2.0 Solid Floor and Ceiling	
2.1 Pressure Coefficients and Integrated Loads . .	48
OSCILLATORY DATA	78
ACCELERATION TARES	281
SAMPLE OF DATA CORRECTED WITH ACCELERATION TARES	298
SUMMARY OF RESULTS OF ACOUSTIC RESONANCE TEST	307

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TWO-DIMENSIONAL WIND TUNNEL TEST
OF AN OSCILLATING ROTOR AIRFOIL
DATA REPORT

(Volume II)

by

L. U. Dadone
Boeing Vertol Company

SUMMARY

An experimental investigation was conducted to determine the quasi-steady and unsteady characteristics of the NLR 7223-62 airfoil, an advanced section designed for helicopter rotor applications. The data were obtained with an airfoil model equipped with 17 differential transducers and mounted in the variable density test section of a blow-down wind tunnel. The test equipment and procedures were similar to other oscillating airfoil tests previously conducted in the same facility.

Quasi-steady pressure data were acquired at Mach numbers between $M = 0.2$ and 0.9 with porous floor and ceiling (4.9% porosity). Drag data were acquired at a limited number of conditions with a wake-traversing probe. Static and oscillatory tests were then run with solid floor and ceiling at Mach numbers between $M = 0.2$ and $M = 0.7$.

The oscillatory test was run at frequencies from 23 Hz to approximately 90 Hz, with amplitudes of oscillation ranging from 2.5° to 10.0° . The test results are presented in two volumes. The first volume documents the test procedure and discusses some of the key results. The second volume is a data report and it contains tabulations of all static and oscillatory data.

LIST OF SYMBOLS

<u>Computer Listing</u>	<u>Text</u>	<u>Description</u>
AERO DAMP		symbol for $[2\pi^2 f_D (\Delta\alpha)^2]^{-1} \oint C_m d\alpha$, work-per-cycle coefficient
ALPHA	α	airfoil angle of attack, deg
ALPHA·NMAX		airfoil angle of attack at maximum value of normal force during a cycle of oscillation, deg

<u>Computer Listing</u>	<u>Text</u>	<u>Description</u>
ALPHA·0	α_o	mean angle of attack during oscillation cycle, deg
	c	airfoil chord, m
	Cd	airfoil drag coefficient (drag force/unit span)/ $q_\infty c$
CM	Cm	airfoil pitching-moment coefficient, (pitching moment/unit span)/ $q_\infty c^2$
CM(MIN)		maximum magnitude of pitching-moment coefficient attained during oscillation
CN	Cn	airfoil normal force coefficient, (normal force/unit span)/ $q_\infty c$
CN(MAX)		maximum magnitude of normal-force coefficient attained during oscillation
DCP	ΔC_p	differential pressure coefficient, $\Delta P/q_\infty$
DEL·ALPHA	$\Delta \alpha$	amplitude of pitching motion, deg
DRIVE HZ	f _D	drive frequency of airfoil motion in pitch, Hertz
K	k	reduced frequency, $\pi f c/V$
MACH NO.	M	Mach number
n PHI		computer symbol for phase lead of response with respect to forcing motion for the nth harmonic, deg
	P _T	tunnel test section total pressure, N/m^2 (lb/in ²)
Q	q	dynamic pressure, defined as $\frac{1}{2} \rho V^2$, N/m^2 (lb/ft ²)
RES n		magnitude of resultant for the nth harmonic
RN	Rn	Reynolds number based on airfoil chord

<u>Computer Listing</u>	<u>Text</u>	<u>Description</u>
TDR		ratio of the work-per-cycle coefficient to the theoretical value
TP		test point identification
V		tunnel velocity, m/sec (ft/sec)
X/C	x/c	chordwise position, measured from the leading edge as a fraction of the chord

SUMMARY OF TEST CONDITIONS

QUASI-STEADY FLOW CONDITIONS

1. Floor and Ceiling with 4.9% Porosity

1.1 Pressures and Integrated Data

<u>Mach No.</u>	<u>Rn x 10⁻⁶</u>	<u>Page No.</u>
0.2	1.55	11
0.2	3.2	13
0.3	4.8	15
0.4	6.3	17
0.5	7.9	19
0.6	3.2	21
0.6	6.3	24
0.6	9.4	27
0.7	10.0	32
0.75	10.0	37
0.8	10.5	39
0.85	11.0	42
0.9	3.6	44
0.9	7.2	45
0.9	11.0	46

1.2 Drag Data - See Table II 47

2. Solid Floor and Ceiling

Pressures and Integrated Data

<u>Mach No.</u>	<u>Rn x 10⁻⁶</u>	<u>Page No.</u>
0.2	3.2	48
0.3	4.8	50
0.4	2.3	53
	4.7	56
	6.3	59
	7.0	62
0.5	7.9	65
0.6	3.1	68
	6.2	70
	9.1	72
0.7	10.0	75

FORCED PITCH OSCILLATION FOR THE NLR 7223-62 AIRFOIL

$\Delta\alpha$ (DEG)	fD (HZ)	M	α_o (DEG)										Rn $\times 10^{-6}$	k
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0			
			PAGE NUMBER OF COMPUTER DATA											
2.5	23	0.2	78	78	79	79	80	80	81	81	82	3.2	0.17	
	23	0.3	82	83	83	84	84	85	85	86	86	4.8	0.12	
	46		87	87	88	88	89	89	90	90	91	4.8	0.23	
	69		91	92	92	93	93	94	94	95	95	4.8	0.34	
	23	0.4	96	96	97	97	98	98	99	99	100	6.4	0.09	
	46		100	101	101	102	102	103	103	104	104	6.4	0.18	
	69		105	105	106	106	107	107	108	108	109	6.4	0.26	
	23	0.5	109	110	110	111	111	112	112	113	-	7.9	0.07	
	46		113	114	114	115	115	116	116	117	-	7.9	0.14	
	69		117	118	118	119	119	120	120	121	-	8.0	0.22	
	23	0.6	121	122	122	123	123	124	124	-	-	9.5	0.06	
	46		125	125	126	126	127	127	128	-	-	9.5	0.12	
	69		128	129	129	130	130	131	131	-	-	9.5	0.18	
	23	0.7	132	132	133	133	134	134	-	-	-	10.0	0.05	
	46		-	135	-	135	136	136	-	-	-	10.0	0.11	
	69		137	137	138	138	139	-	-	-	-	10.0	0.16	

FORCED PITCH OSCILLATION FOR THE NLR 7223-62 AIRFOIL

$\Delta\alpha$ (DEG)	f_D (HZ)	M	α_0 (DEG)										Rn $\times 10^{-6}$	k
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0			
			PAGE NUMBER OF COMPUTER DATA											
5.0	23	0.2	139	140	140	141	141	142	142	143	143	3.2	0.175	
	46		144	144	145	145	146	146	147	147	148	3.2	0.35	
	69		148	149	149	150	150	151	151	152	152	3.2	0.51	
	23	0.3	153	153	154	154	155	155	156	156	157	4.8	0.12	
	46		157	158	158	159	159	160	160	161	161	4.8	0.23	
	69		162	162	163	163	164	164	165	165	166	4.8	0.35	
	23	0.4	166	167	167	168	168	169	169	170	170	2.4	0.09	
			171	171	172	172	173	173	174	174	175	4.7		
			175	176	176	177	177	178	178	179	179	6.4		
			180	180	181	181	182	182	183	183	184	7.0		
	46		184	185	185	186	186	187	187	188	188	6.4	0.17	
	50.		-	-	189	189	190	190	191	-	-	6.4	0.19	
	52		-	-	191	192	192	193	193	-	-	6.4	0.192	
	53		-	-	194	194	195	195	196	-	-	6.4	0.195	
	54		-	-	196	197	197	198	198	-	-	6.4	0.20	
	69		199	199	200	200	201	201	202	202	203	6.4	0.26	

FORCED PITCH OSCILLATION FOR THE NLR 7223-62 AIRFOIL

$\Delta\alpha$ (DEG)	f _D (HZ)	M	α_0 (DEG)										Rn x10 ⁻⁶	k
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0			
			PAGE NUMBER OF COMPUTER DATA											
5.0	88	0.4	203	204	204	205	205	206	206	-	-	2.4	0.34	
	23	0.5	207	207	208	208	209	209	-	210	210	7.9	0.07	
			-	-	-	-	211	211	212	-	-	8.0	0.07	
	46		213	213	214	214	215	215	216	216	217	8.0	0.14	
	69		217	218	218	219	219	220	-	220	-	8.2	0.20	
			221	221	-	-	-	-	-	-	-	8.2	0.20	
23	0.6		222	222	223	223	224	-	-	-	-	9.3	0.06	
			-	-	-	-	224	225	225	226	-	9.2	0.06	
			226	227	227	228	228	229	229	230	-	6.2	0.06	
			-	230	-	231	231	232	232	-	-	3.1	0.06	
46			-	-	-	-	-	233	234	234	-	9.2	0.12	
			-	-	-	-	235	-	-	-	-	9.3	0.12	
	69		235	236	236	237	237	238	238	-	-	9.2	0.18	
23	0.7		239	239	240	240	241	241	-	-	-	10.0	0.05	

FORCED PITCH OSCILLATION FOR THE NLR 7223-62 AIRFOIL

A ₀ (DEG)	f _D (HZ)	M	α ₀ (DEG)										Rn x10 ⁻⁶ k	
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0			
			PAGE NUMBER OF COMPUTER DATA											
7.5	23	0.2	-	242	242	243	243	243	244	-	-	-	3.2	0.17
		0.3	244	245	245	246	246	246	247	-	-	-	4.8	0.116
		0.4	247	248	248	249	249	249	-	-	-	-	6.4	0.09
	46		250	250	251	251	252	252	-	-	-	-	6.4	0.17
	23	0.5	252	253	253	254	254	-	-	-	-	-	8.0	0.07
	46		254	255	255	256	256	-	-	-	-	-	8.0	0.14
	23	0.6	256	257	257	-	-	-	-	-	-	-	9.4	0.06
		0.7	258	258	259	-	-	-	-	-	-	-	9.4	0.057

FORCED PITCH OSCILLATION FOR THE NLR 7223-62 AIRFOIL

$\Delta\alpha$ (DEG)	f (HZ)	M	α_o (DEG)									Rn $\times 10^{-6}$	k	
			0.0	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0			
PAGE NUMBER OF COMPUTER DATA														
10.0	23	0.2	259	260	260	261	261	-	-	-	-	3.2	0.17	
		0.3	262	-	262	263	263	-	-	-	-	4.8	0.115	
		0.4	264	264	265	265	265	-	-	-	-	6.4	0.086	
	46		266	267	267	268	-	-	-	-	-	6.4	0.17	
	69		268	269	269	270	-	-	-	-	-	6.4	0.27	
	23	0.5	270	271	271	272	-	-	-	-	-	7.9	0.07	
		0.6	272	273	273	-	-	-	-	-	-	9.3	0.06	
		0.7	274	274	275	-	-	-	-	-	-	10.0	0.052	
5.0	40	0.2	-	-	-	-	-	276 ¹	276	277 ²	-	3.3	0.29	
7.5			-	-	-	-	-	277 ¹	278	278 ²	-			
10.0			-	-	-	-	-	279 ¹	279	280 ²	-			

NOTES:

- ¹ $\alpha_o = 14^\circ$
- ² $\alpha_o = 16^\circ$

TABLE I. SUMMARY OF MODEL CHARACTERISTICS

Airfoil Section	NLR 7223-62 (or NLR-1)
Model Span	0.3048m (12 inches, nominal)
Model Scale	1/4.23, based on a 0.686m (2.25 ft) full-scale blade chord
Model Chord	0.162m (6.38 in.)
Thickness Ratio	8.6 percent
Construction	Machined from Maraging Steel
<u>Transducers:</u>	
Type	Kulite Model No. 63-11967, Differential
Number Installed	17
Location in Percent Chord	1.01, 1.99, 3.0, 4.91, 7.37, 9.91, 14.93, 19.99, 24.97, 29.98, 39.91, 50.07, 60.05, 70.09, 80.02, 89.96, 96.91
Pressure Range	$\pm 5.17 \times 10^5 \text{ N/m}^2$ ($\pm 75 \text{ psi}$) from 1 to 5 percent chord $\pm 3.45 \times 10^5 \text{ N/m}^2$ ($\pm 50 \text{ psi}$) from 7.5 to 97 percent chord
Minimum Natural Frequency as Installed	2,800 Hz

FLOOR AND CEILING WITH 4.9% POROSITY

CATA TYPE	X/C	M = 0.199	R ₀ = 1.55 x 10 ⁶	FLOOR AND CEILING WITH 4.9% POROSITY	-2.544	-2.107	-1.462
ALPHA		-1.277	-7.462	-6.415	-3.676	-3.512	-2.544
CM		-0.414	-3.378	-3.233	-0.204	-0.132	-0.071
CEN		-0.033	-1.057	-0.034	-0.022	-0.025	-0.015
CCP 1	0.11	-2.620	-2.834	-3.941	-3.263	-2.666	-2.430
CCP 2	0.20	-2.108	-2.170	-1.581	-1.908	-1.467	-1.393
CCP 3	0.30	-1.826	-1.991	-1.496	-1.422	-1.176	-1.081
CCP 4	0.39	-2.050	-2.507	-1.221	-1.161	-0.963	-0.695
CCP 5	0.47	-1.920	-1.815	-1.806	-0.764	-0.670	-0.381
CCP 6	0.59	-1.475	-1.701	-1.455	-0.363	-0.281	-0.175
CCP 7	0.69	-1.254	-1.057	-0.743	-0.356	-0.313	-0.203
CCP 8	0.79	-1.015	-0.648	-0.397	-0.044	-0.080	-0.161
CCP 9	0.85	-0.644	-0.642	-0.320	-0.204	-0.112	-0.075
CCP10	0.90	-0.617	-0.495	-0.240	-0.180	-0.105	-0.081
CCP11	0.95	-0.393	-0.316	-0.147	-0.138	-0.022	-0.035
CCP12	0.91	-0.142	-0.135	-0.111	-0.064	-0.017	-0.112
CCP13	0.60	-0.257	-0.029	-0.026	-0.163	-0.028	-0.064
CCP14	0.70	-0.113	0.051	0.085	0.077	0.018	0.165
CCP15	0.80	0.135	0.166	0.072	0.082	0.175	0.142
CCP16	0.90	-0.103	0.041	0.014	-0.025	-0.026	-0.087
CCP17	0.99	-0.131	-0.052	-0.021	-0.119	-0.056	-0.223

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AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE	X/C	M = 0.159 $R_n = 1.55 \times 10^6$										FLOOR AND CEILING WITH 4.9% POROSITY				
		7.412	7.937	9.614	11.093	11.440	13.422	14.622	15.093	16.008	16.297	16.008	15.093	14.622	13.422	11.440
ALPHA		0.744	0.840	0.989	1.042	1.097	1.137	1.175	1.145	0.934	0.922	0.934	1.145	1.175	1.137	1.097
CN		-0.003	-0.005	-0.005	0.001	0.006	0.014	0.005	-0.055	-0.075	-0.090	-0.075	-0.055	0.005	0.014	0.006
DCP 1	-0.10	3.048	3.072	4.316	5.656	5.796	5.715	6.243	1.411	1.127	0.372	1.127	1.411	6.243	5.715	5.796
DCP 2	-0.20	2.586	3.475	3.630	4.085	4.444	4.804	4.821	2.665	1.603	1.540	1.603	2.665	4.821	4.804	4.444
DCP 3	-0.30	2.864	2.575	3.726	4.052	4.443	4.741	4.468	2.538	1.823	1.755	1.823	2.538	4.468	4.741	4.052
DCP 4	-0.40	2.364	2.545	3.122	3.260	3.676	3.668	4.016	3.746	3.020	3.081	3.020	3.746	4.016	3.668	3.676
DCP 5	-0.74	2.038	2.347	2.761	2.984	3.145	3.395	3.371	3.143	2.531	2.405	2.531	3.143	3.371	3.395	3.145
DCP 6	-0.99	1.921	2.229	2.617	2.728	2.904	3.025	3.025	2.691	2.174	2.146	2.174	2.691	3.025	3.025	2.904
DCP 7	-1.49	1.424	1.619	1.834	1.920	2.023	2.140	2.173	1.837	1.234	1.332	1.234	1.837	2.173	2.140	2.023
DCP 8	-2.00	1.223	1.386	1.458	1.772	1.743	1.574	1.794	2.101	1.301	1.233	1.301	2.101	1.794	1.574	1.743
DCP 9	-2.50	0.587	1.121	1.322	1.379	1.420	1.568	1.503	1.616	1.211	1.117	1.211	1.616	1.503	1.568	1.420
DCP10	-3.00	0.811	0.908	1.138	1.164	1.209	1.287	1.358	1.418	1.104	0.962	1.104	1.418	1.358	1.287	1.209
DCP11	-3.99	0.658	0.933	0.879	0.914	1.026	1.035	1.115	1.296	1.031	0.897	1.031	1.296	1.115	1.035	1.026
DCP12	-5.01	0.613	0.660	0.780	0.765	0.859	0.815	0.892	1.044	0.867	0.898	0.867	1.044	0.892	0.815	0.859
DCP13	-6.03	0.463	0.409	0.656	0.584	0.521	0.547	0.654	0.739	0.670	0.811	0.670	0.739	0.654	0.547	0.521
DCP14	-7.01	0.369	0.424	0.457	0.396	0.451	0.477	0.384	0.567	0.626	0.678	0.626	0.567	0.384	0.477	0.451
DCP15	-8.00	0.250	0.265	0.291	0.265	0.288	0.238	0.321	0.334	0.568	0.577	0.568	0.334	0.321	0.238	0.288
DCP16	-9.00	-0.049	-0.066	0.007	0.066	-0.007	0.012	0.058	0.221	0.291	0.335	0.291	0.221	0.058	0.012	-0.007
DCP17	-9.67	-0.134	-0.063	-0.104	-0.059	-0.051	-0.138	-0.118	-0.152	-0.063	-0.061	-0.063	-0.152	-0.118	-0.138	-0.051

DATA TYPE	X/C	18.726	19.851	18.726	19.851	18.726	19.851	18.726	19.851	18.726	19.851	18.726	19.851	18.726	19.851	18.726	19.851
		0.965	0.935	0.965	0.935	0.965	0.935	0.965	0.935	0.965	0.935	0.965	0.935	0.965	0.935	0.965	0.935
ALPHA		0.744	0.840	0.989	1.042	1.097	1.137	1.175	1.145	0.934	0.922	0.934	1.145	1.175	1.137	1.097	1.042
CN		-0.003	-0.005	-0.005	0.001	0.006	0.014	0.005	-0.055	-0.075	-0.090	-0.075	-0.055	0.005	0.014	0.006	0.001
DCP 1	-0.10	3.048	3.072	4.316	5.656	5.796	5.715	6.243	1.411	1.127	0.372	1.127	1.411	6.243	5.715	5.796	4.316
DCP 2	-0.20	2.586	3.475	3.630	4.085	4.444	4.804	4.821	2.665	1.603	1.540	1.603	2.665	4.821	4.804	4.444	3.630
DCP 3	-0.30	2.864	2.575	3.726	4.052	4.443	4.741	4.468	2.538	1.823	1.755	1.823	2.538	4.468	4.741	4.052	2.575
DCP 4	-0.40	2.364	2.545	3.122	3.260	3.676	3.668	4.016	3.746	3.020	3.081	3.020	3.746	4.016	3.668	3.676	2.545
DCP 5	-0.74	2.038	2.347	2.761	2.984	3.145	3.395	3.371	3.143	2.531	2.405	2.531	3.143	3.371	3.395	3.145	2.347
DCP 6	-0.99	1.921	2.229	2.617	2.728	2.904	3.025	3.025	2.691	2.174	2.146	2.174	2.691	3.025	3.025	2.904	2.229
DCP 7	-1.49	1.424	1.619	1.834	1.920	2.023	2.140	2.173	1.837	1.234	1.332	1.234	1.837	2.173	2.140	2.023	1.619
DCP 8	-2.00	1.223	1.386	1.458	1.772	1.743	1.574	1.794	2.101	1.301	1.233	1.301	2.101	1.794	1.574	1.743	1.386
DCP 9	-2.50	0.587	1.121	1.322	1.379	1.420	1.568	1.503	1.616	1.211	1.117	1.211	1.616	1.503	1.568	1.420	1.121
DCP10	-3.00	0.811	0.908	1.138	1.164	1.209	1.287	1.358	1.418	1.104	0.962	1.104	1.418	1.358	1.287	1.209	0.908
DCP11	-3.99	0.658	0.933	0.879	0.914	1.026	1.035	1.115	1.296	1.031	0.897	1.031	1.296	1.115	1.035	1.026	0.933
DCP12	-5.01	0.613	0.660	0.780	0.765	0.859	0.815	0.892	1.044	0.867	0.898	0.867	1.044	0.892	0.815	0.859	0.660
DCP13	-6.03	0.463	0.409	0.656	0.584	0.521	0.547	0.654	0.739	0.670	0.811	0.670	0.739	0.654	0.547	0.521	0.409
DCP14	-7.01	0.369	0.424	0.457	0.396	0.451	0.477	0.384	0.567	0.626	0.678	0.626	0.567	0.384	0.477	0.451	0.424
DCP15	-8.00	0.250	0.265	0.291	0.265	0.288	0.238	0.321	0.334	0.568	0.577	0.568	0.334	0.321	0.238	0.288	0.265
DCP16	-9.00	-0.049	-0.066	0.007	0.066	-0.007	0.012	0.058	0.221	0.291	0.335	0.291	0.221	0.058	0.012	-0.007	-0.066
DCP17	-9.69	-0.134	-0.063	-0.104	-0.059	-0.051	-0.138	-0.118	-0.152	-0.063	-0.061	-0.063	-0.152	-0.118	-0.138	-0.051	-0.063

M = 0.2 $R_n = 3.2 \times 10^6$

AIRFOIL NLR 7223-62
STEADY FORCES AND MOMENTS
FLOOR AND CEILING WITH 4.9%
POROSITY

DATA
TYPE X/C

ALPHA		-10.1	-8.68	-7.24	-5.72	-4.36	-3.01
CN		-0.638	-0.579	-0.491	-0.407	-0.293	-0.159
CM		-0.024	-0.030	-0.039	-0.036	-0.034	-0.032
DCP 1	.010	-2.416	-2.314	-5.054	-4.706	-3.603	-2.555
DCP 2	.020	1.809	2.008	1.091	1.580	2.221	2.888
DCP 3	.030	-2.866	-2.188	-2.287	-2.307	-1.822	-1.300
DCP 4	.049	-2.040	-2.399	-2.101	-1.700	-1.303	-0.867
DCP 5	.074	-1.897	-2.009	-1.625	-1.312	-0.964	-0.589
DCP 6	.099	-1.645	-1.579	-1.207	-0.917	-0.633	-0.329
DCP 7	.149	-1.475	-1.282	-0.927	-0.704	-0.497	-0.255
DCP 8	.200	-1.334	-1.165	-0.745	-0.575	-0.403	-0.204
DCP 9	.250	-1.084	-1.035	-0.618	-0.478	-0.321	-0.170
DCP 10	.300	-0.828	-0.828	-0.464	-0.340	-0.216	-0.068
DCP 11	.399	-0.552	-0.507	-0.333	-0.254	-0.174	-0.052
DCP 12	.501	-0.398	-0.302	-0.284	-0.227	-0.161	-0.077
DCP 13	.600	-0.186	-0.092	-0.110	-0.092	-0.046	0.019
DCP 14	.701	-0.052	-0.0	-0.0	0.009	0.052	0.106
DCP 15	.800	-0.009	0.009	0.009	-0.0	0.018	-0.045
DCP 16	.900	-0.133	-0.113	-0.150	-0.160	-0.171	-0.153
DCP 17	.969	0.206	0.354	0.426	0.484	0.507	0.5306

ALPHA		-1.643	-0.276	1.0	2.458	3.831	5.197
CN		-0.039	0.090	0.209	0.3348	0.468	0.597
CM		-0.030	-0.029	-0.026	-0.024	-0.023	-0.020

DCP 1	.010	-1.675	-0.775	0.059	0.873	1.698	2.537
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	-0.776	-0.250	0.293	0.853	1.446	2.034
DCP 4	.049	-0.440	0.006	0.436	0.904	1.390	1.860
DCP 5	.074	-0.248	0.125	0.479	0.848	1.228	1.628
DCP 6	.099	-0.036	0.271	0.556	0.865	1.185	1.506
DCP 7	.149	-0.040	0.211	0.425	0.668	0.871	1.134
DCP 8	.200	-0.027	0.162	0.336	0.523	0.720	0.918
DCP 9	.250	-0.024	0.140	0.291	0.453	0.625	0.789
DCP 10	.300	0.061	0.199	0.340	0.460	0.612	0.749
DCP 11	.399	0.042	0.158	0.254	0.363	0.474	0.573
DCP 12	.501	0.0	0.096	0.167	0.239	0.330	0.412
DCP 13	.600	0.076	0.124	0.183	0.242	0.303	0.363
DCP 14	.701	0.142	0.189	0.226	0.274	0.322	0.360
DCP 15	.800	0.073	0.101	0.111	0.140	0.178	0.198
DCP 16	.900	-0.145	-0.137	-0.128	-0.119	-0.100	-0.090
DCP 17	.969	0.526	0.444	0.350	0.294	0.296	0.228

M = 0.2 $R_n = 3.2 \times 10^6$

AIRFOIL NLR 7223-62
STEADY FORCES AND MOMENTS
FLOOR AND CEILING WITH 4.9%
POROSITY

DATA
TYPE X/C

ALPHA		6.564	7.920	9.291	10.65	12.185	13.53
CN		0.725	0.856	0.986	1.099	1.224	1.327
CM		-0.018	-0.015	-0.011	-0.008	-0.007	-

DCP 1	.010	3.348	4.271	5.266	5.860	6.056	6.599
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	2.568	3.166	3.753	4.304	4.928	5.471
DCP 4	.049	2.340	2.843	3.326	3.787	4.297	4.722
DCP 5	.074	2.005	2.395	2.780	3.148	3.560	3.896
DCP 6	.099	1.821	2.149	2.469	2.765	3.096	3.373
DCP 7	.149	1.382	1.640	1.876	2.090	2.351	2.556
DCP 8	.200	1.109	1.300	1.504	1.675	1.880	2.056
DCP 9	.250	0.946	1.113	1.273	1.430	1.608	1.743
DCP10	.300	0.879	1.018	1.143	1.264	1.405	1.522
DCP11	.399	0.695	0.797	0.899	0.999	1.112	1.193
DCP12	.501	0.503	0.578	0.662	0.735	0.820	0.887
DCP13	.600	0.414	0.475	0.527	0.577	0.629	0.662
DCP14	.701	0.399	0.438	0.477	0.497	0.536	0.547
DCP15	.800	0.218	0.238	0.258	0.268	0.288	0.299
DCP16	.900	-0.081	-0.071	-0.051	-0.051	-0.031	-0.020
DCP17	.969	0.209	0.230	0.221	0.181	0.040	-

ALPHA		14.85	16.19	17.53	18.88	20.14
CN		1.407	1.069	0.971	0.982	1.056
CM		0.002	-0.059	-0.070	-0.064	-0.079

DCP 1	.010	7.333	4.527	3.799	3.981	1.839
DCP 2	.020	-	-	-	-	-
DCP 3	.030	5.927	3.702	3.396	3.349	1.713
DCP 4	.049	5.038	3.326	2.794	2.639	3.729
DCP 5	.074	4.146	2.390	1.871	1.764	2.700
DCP 6	.099	3.557	1.783	1.402	1.486	2.052
DCP 7	.149	2.712	1.453	1.256	1.383	1.865
DCP 8	.200	2.192	1.284	1.122	1.244	1.275
DCP 9	.250	1.858	1.210	1.053	1.174	1.176
DCP10	.300	1.613	1.180	1.034	1.122	1.125
DCP11	.399	1.261	1.086	0.975	1.030	1.054
DCP12	.501	0.925	0.936	0.881	0.880	0.928
DCP13	.600	0.683	0.795	0.795	0.743	0.836
DCP14	.701	0.548	0.729	0.767	0.699	0.825
DCP15	.800	0.299	0.580	0.638	0.589	0.688
DCP16	.900	-0.020	0.267	0.288	0.277	0.319
DCP17	.969	-	-	-	-	-

M = 0.3 $R_n = 4.8 \times 10^6$

AIRFOIL NLR 7223-62
STEADY FORCES AND MOMENTS
FLOOR AND CEILING WITH 4.9%
POROSITY

DATA TYPE	X/C						
ALPHA		-9.78	-8.46	-7.12	-5.73	-4.369	-3.00
CN		-0.665	-0.582	-0.553	-0.448	-0.323	-0.192
CM		-0.012	-0.031	-0.031	-0.030	-0.028	-0.026
DCP 1	.010	-2.083	-2.357	-5.189	-4.747	-3.795	-2.690
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	-1.910	-2.409	-2.867	-2.391	-1.886	-1.353
DCP 4	.049	-2.127	-2.427	-2.114	-1.729	-1.312	-0.880
DCP 5	.074	-1.968	-2.189	-1.611	-1.289	-0.938	-0.585
DCP 6	.099	-1.798	-1.885	-1.255	-0.979	-0.685	-0.381
DCP 7	.149	-1.625	-1.434	-.982	-0.765	-0.539	-0.300
DCP 8	.200	-1.176	-0.932	-0.813	-0.635	-0.454	-0.261
DCP 9	.250	-1.108	-0.912	-0.685	-0.536	-0.374	-0.211
DCP10	.300	-1.026	-0.738	-0.546	-0.420	-0.279	-0.137
DCP11	.399	-0.736	-0.446	-0.410	-0.314	-0.200	-0.094
DCP12	.501	-0.471	-0.293	-0.339	-0.268	-0.188	-0.104
DCP13	.600	-0.240	-0.156	-0.220	-0.173	-0.113	-0.049
DCP14	.701	-0.041	-0.008	-0.045	-0.011	0.034	0.080
DCP15	.800	-0.015	-0.008	-0.031	-0.023	0.0	0.023
DCP16	.900	-0.086	-0.082	-0.131	-0.144	-0.136	-0.129
DCP17	.969	-	-	-	-	-	-
ALPHA		-1.64	-0.24	1.14	2.50	3.88	6.62
CN		-0.059	0.075	0.204	0.341	0.480	0.742
CM		-0.024	-0.023	-0.022	-0.021	-0.020	-0.016
DCP 1	.010	-1.69	-0.779	0.087	0.946	1.797	3.461
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	-0.795	-0.247	0.324	0.914	1.512	2.640
DCP 4	.049	-0.427	0.039	0.506	0.986	1.484	2.447
DCP 5	.074	-0.2105	0.183	0.547	0.940	1.336	2.105
DCP 6	.099	-0.062	0.261	0.578	0.906	1.245	1.881
DCP 7	.149	-0.059	0.185	0.420	0.665	0.900	1.409
DCP 8	.200	-0.062	0.140	0.323	0.528	0.739	1.137
DCP 9	.250	-0.049	0.124	0.289	0.458	0.640	0.965
DCP10	.300	0.003	0.152	0.292	0.436	0.584	0.866
DCP11	.399	0.022	0.136	0.245	0.360	0.481	0.700
DCP12	.501	-0.015	0.075	0.158	0.249	0.341	0.511
DCP13	.600	0.016	0.078	0.144	0.211	0.283	0.405
DCP14	.701	0.123	0.174	0.221	0.273	0.321	0.413
DCP15	.800	0.051	0.079	0.103	0.135	0.168	0.217
DCP16	.900	-0.117	-0.113	-0.114	-0.097	-0.072	-0.055
DCP17	.969	-	-	-	-	-	-

M = 0.3 $R_n = 4.8 \times 10^6$

AIRFOIL NLR 7223-62
STEADY FORCES AND MOMENTS
FLOOR AND CEILING WITH 4.9%
POROSITY

DATA
TYPE X/C

ALPHA		7.982	9.35	10.71	12.27	13.79	15.22
CN		0.878	1.006	1.124	1.244	1.266	1.106
CM		-0.014	-0.011	-0.009	-0.002	0.011	-0.050

DCP 1	.010	4.406	5.204	5.804	7.051	7.698	4.823
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	3.260	3.874	4.426	4.994	5.265	3.708
DCP 4	.049	2.936	3.419	3.889	4.331	4.483	3.487
DCP 5	.074	2.499	2.886	3.246	3.601	3.720	2.621
DCP 6	.099	2.203	2.521	2.823	3.115	3.204	2.049
DCP 7	.149	1.659	1.894	2.117	2.340	2.415	1.601
DCP 8	.200	1.334	1.528	1.721	1.905	1.963	1.414
DCP 9	.250	1.138	1.297	1.455	1.613	1.662	1.313
DCP10	.300	1.000	1.138	1.260	1.390	1.419	1.233
DCP11	.399	0.812	0.923	1.022	1.115	1.117	1.138
DCP12	.501	0.600	0.680	0.761	0.827	0.809	0.953
DCP13	.600	0.469	0.528	0.583	0.625	0.580	0.784
DCP14	.701	0.457	0.497	0.525	0.541	0.467	0.686
DCP15	.800	0.242	0.266	0.278	0.283	0.247	0.499
DCP16	.900	-0.043	-0.034	-0.021	-0.017	0.009	0.241
DCP17	.969	-	-	-	-	-	-

ALPHA		16.66	18.15	19.65	20.19
CN		0.980	0.983	1.052	0.980
CM		-0.067	-0.065	-0.079	-0.070

DCP 1	.010	3.851	3.968	2.654	1.936
DCP 2	.020	-	-	-	-
DCP 3	.030	3.321	3.113	1.673	1.606
DCP 4	.049	2.764	2.561	3.272	3.238
DCP 5	.074	1.867	1.758	2.428	2.419
DCP 6	.099	1.459	1.520	1.973	1.967
DCP 7	.149	1.279	1.388	1.719	1.736
DCP 8	.200	1.172	1.286	1.499	1.286
DCP 9	.250	1.102	1.191	1.223	1.117
DCP10	.300	1.067	1.120	1.125	1.050
DCR11	.399	1.031	1.044	1.062	0.984
DCP12	.501	0.911	0.903	0.944	0.853
DCP13	.600	0.801	0.762	0.841	0.747
DCP14	.701	0.738	0.709	0.812	0.749
DCP15	.800	0.576	0.555	0.668	0.621
DCP16	.900	0.289	0.280	0.314	0.302
DCP17	.969	-	-	-	-

M = 0.4 $R_n = 6.3 \times 10^6$

AIRFOIL NLR 7223-62
STEADY FORCES AND MOMENTS
FLOOR AND CEILING WITH 4.9%
POROSITY

DATA
TYPE X/C

ALPHA		-10.11	-8.48	-7.27	-4.20	-2.82	0.12
CN		-0.727	-0.598	-0.540	-0.336	-0.197	0.106
CM		0.003	-0.035	-0.035	-0.028	-0.026	-0.023

DCP 1	.010	-1.973	-2.450	-4.220	-4.002	-2.741	-0.591
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	-1.794	-3.081	-3.316	-1.918	-1.360	-0.106
DCP 4	.049	-2.318	-2.572	-2.347	-1.323	-0.862	0.169
DCP 5	.074	-2.087	-2.329	-1.691	-0.941	-0.561	0.309
DCP 6	.099	-1.824	-1.835	-1.346	-0.700	-0.575	0.346
DCP 7	.149	-1.510	-1.361	-1.029	-0.540	-0.293	0.257
DCP 8	.200	-1.163	-1.033	-0.762	-0.466	-0.266	0.176
DCP 9	.250	-1.148	-0.865	-0.687	-0.386	-0.215	0.167
DCP 10	.300	-1.105	-0.698	-0.523	-0.295	-0.147	0.182
DCP 11	.399	-0.886	-0.416	-0.411	-0.224	-0.106	0.153
DCP 12	.501	-0.622	-0.303	-0.313	-0.187	-0.100	0.099
DCP 13	.600	-0.359	-0.173	-0.185	-0.121	-0.056	0.092
DCP 14	.701	-0.104	-0.006	-0.009	0.029	0.077	0.186
DCP 15	.800	-0.060	-0.002	-0.004	-0.011	0.011	0.079
DCP 16	.900	-0.115	-0.080	-0.092	-0.148	-0.144	-0.121
DCP 17	.969	-	-	-	-	-	-

ALPHA		1.36	4.68	5.70	6.70	7.70	8.71
CN		0.235	0.578	0.683	0.783	0.884	0.985
CM		-0.021	-0.018	-0.017	-0.016	-0.013	-0.008

DCP 1	.010	0.215	2.313	2.968	3.642	4.481	5.731
DCP 2	.020	-	-	-	-	-	-
DCP 3	.030	0.438	1.951	2.420	2.837	3.295	3.720
DCP 4	.049	0.624	1.872	2.253	2.637	3.014	3.367
DCP 5	.074	0.659	1.664	1.964	2.266	2.562	2.846
DCP 6	.099	0.661	1.522	1.755	2.004	2.244	2.473
DCP 7	.149	0.503	1.107	1.298	1.490	1.668	1.841
DCP 8	.200	1.380	0.888	1.048	1.199	1.343	1.484
DCP 9	.250	1.334	1.759	1.894	1.016	1.138	1.255
DCP 10	.300	0.316	0.682	0.794	0.901	1.004	1.101
DCP 11	.399	1.263	0.559	0.645	0.728	0.810	0.886
DCP 12	.501	0.183	0.411	0.482	0.544	0.605	0.664
DCP 13	.600	0.154	0.323	0.378	0.428	0.473	0.514
DCP 14	.701	0.236	0.359	0.394	0.425	0.455	0.477
DCP 15	.800	0.105	0.178	0.201	0.222	0.238	0.249
DCP 16	.900	-0.114	-0.082	-0.076	-0.066	-0.056	-0.051
DCP 17	.969	-	-	-	-	-	-

M = 0.4
 $R_n = 6.3 \times 10^6$

AIRFOIL NLR 7223-62
 STEADY FORCES AND MOMENTS
 FLOOR AND CEILING WITH 4.9%
 POROSITY

DATA TYPE	X/C					
ALPHA		9.70	10.71	11.68	12.86	16.48
CN		1.055	1.086	1.086	1.017	1.015
CM		-0.004	0.002	0.012	0.009	-0.046
DCP 1	.010	6.421	6.566	5.922	4.593	3.688
DCP 2	.020	-	-	-	-	-
DCP 3	.030	3.956	4.364	5.065	4.876	3.175
DCP 4	.049	3.606	3.722	4.079	3.361	2.677
DCP 5	.074	3.059	3.170	3.238	2.939	2.398
DCP 6	.099	2.652	2.743	2.741	2.642	2.179
DCP 7	.149	1.986	2.071	2.101	2.129	1.727
DCP 8	.200	1.604	1.684	1.711	1.681	1.461
DCP 9	.250	1.359	1.418	1.432	1.379	1.298
DCP 10	.300	1.182	1.229	1.229	1.158	1.144
DCP 11	.399	0.947	0.975	0.961	0.918	1.004
DCP 12	.501	0.710	0.720	0.698	0.653	0.840
DCP 13	.600	0.540	0.533	0.486	0.437	0.673
DCP 14	.701	0.477	0.445	0.379	0.335	0.602
DCP 15	.800	0.243	0.215	0.176	0.200	0.491
DCP 16	.900	-0.049	-0.053	-0.037	0.024	0.229
DCP 17	.969	-	-	-	-	-

DATA TYPE	X/C	M = 0.5 Rn = 7.9 x 10 ⁶										AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENT FLOOR AND CEILING WITH 4.5% POROSITY															
		-9.99	-8.99	-8.16	-6.82	-5.89	-5.00	-4.10	-3.06	-2.04	-1.07	-0.995	-0.695	-0.002	-0.670	-0.611	-0.031	-0.508	-0.410	-0.027	-0.020	-0.319	-0.227	-0.119	-0.018	-0.010	-0.017
ALPHA																											
CN																											
CM																											
DCP 1	.010	-2.231	-2.568	-2.530	-3.983	4.252	-	-3.028	-2.715	-2.095	-1.590	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637
DCP 2	.020	-2.933	-3.485	-3.561	-3.220	3.252	-3.028	-2.715	-2.095	-1.590	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637	-1.637
DCP 3	.030	-2.619	-2.957	-2.954	-2.992	2.775	-2.668	-1.989	-1.567	-1.130	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688	-0.688
DCP 4	.049	-2.052	-2.075	-2.492	-2.405	2.210	-2.046	-1.306	-0.986	-0.618	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257	-0.257
DCP 5	.074	-1.821	-2.050	-2.269	-1.810	1.585	-1.423	-0.903	-0.630	-0.324	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029
DCP 6	.099	-1.740	-1.846	-1.722	-1.392	1.142	-0.986	-0.537	-0.358	-0.163	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059
DCP 7	.149	-1.545	-1.553	-1.321	-1.039	0.820	-0.666	-0.476	-0.380	-0.252	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
DCP 8	.200	-1.189	-1.168	-1.051	-0.791	0.683	-0.571	-0.465	-0.315	-0.149	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
DCP 9	.250	-1.161	-1.223	-1.058	-0.655	0.565	-0.476	-0.380	-0.294	-0.185	-0.064	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
DCP10	.300	-1.031	-1.012	-0.836	-0.513	0.451	-0.375	-0.289	-0.228	-0.144	-0.048	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
DCP11	.399	-0.777	-0.623	-0.476	-0.380	0.340	-0.289	-0.228	-0.144	-0.048	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045	0.045
DCP12	.501	-0.510	-0.368	-0.305	-0.270	0.247	-0.216	-0.175	-0.114	-0.040	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
DCP13	.600	-0.277	-0.205	-0.161	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132	0.132
DCP14	.701	-0.062	-0.009	0.013	0.132	0.034	0.038	0.052	0.081	0.121	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160	0.160
DCP15	.800	-0.036	0.005	0.021	0.026	0.016	0.008	0.006	0.015	0.038	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
DCP16	.900	-0.084	-0.053	-0.036	-0.039	-0.060	-0.082	-0.101	-0.117	-0.115	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108
DCP17	.969	-0.037	-0.017	-0.003	-0.006	-0.010	-0.022	-0.028	-0.041	-0.048	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053	-0.053

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

ALPHA	-0.05	0.99	1.95	2.97	4.0	4.94	6.00	6.99	7.95	8.97
CN	0.104	0.220	0.326	0.439	0.551	0.659	0.768	0.875	0.955	0.994
CM	-0.017	-0.017	-0.017	-0.017	-0.016	-0.0151	-0.013	-0.009	-0.007	0.000
DCP 1	.010	-0.948	-0.240	0.426	0.977	1.623	2.349	3.152	4.294	4.304
DCP 2	.020	-0.456	0.114	0.638	1.185	1.739	2.278	2.827	3.813	4.606
DCP 3	.030	-0.220	0.265	0.708	1.191	1.680	2.160	2.651	2.810	4.317
DCP 4	.049	0.143	0.549	0.929	1.352	1.778	2.199	2.693	3.187	3.196
DCP 5	.074	0.304	0.645	0.947	1.285	1.627	1.965	2.313	2.636	3.715
DCP 6	.099	0.335	0.620	0.879	1.166	1.454	1.722	2.003	2.260	2.419
DCP 7	.149	0.247	0.463	0.655	0.868	1.078	1.276	1.475	1.660	1.802
DCP 8	.200	0.172	0.359	0.519	0.691	0.859	1.016	1.176	1.327	1.445
DCP 9	.250	0.175	0.325	0.461	0.606	0.746	0.878	1.014	1.138	1.246
DCP10	.300	0.177	0.304	0.418	0.542	0.659	0.770	0.881	1.131	1.076
DCP11	.399	0.147	0.248	0.339	0.436	0.533	0.622	0.708	0.791	0.863
DCP12	.501	0.111	0.189	0.260	0.336	0.409	0.480	0.547	0.611	0.666
DCP13	.600	0.118	0.178	0.232	0.367	0.346	0.398	0.450	0.495	0.535
DCP14	.701	0.203	0.246	0.284	0.326	0.365	0.400	0.433	0.459	0.481
DCP15	.800	0.085	-0.105	0.133	0.158	0.181	0.201	0.217	0.230	0.239
DCP16	.900	-0.102	-0.095	-0.088	-0.080	-0.073	-0.066	-0.061	-0.058	-0.057
DCP17	.969	0.058	-0.064	-0.068	-0.071	-0.075	-0.078	-0.083	-0.089	-0.095

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENT FLOOR AND CEILING WITH 4.5% POROSITY														
DATA TYPE	X/C	M = 0.5 Rn = 7.9 x 10 ⁶												
ALPHA		10.11	10.42	10.59	10.77	11.10	11.77	12.12	12.28	12.45	12.60			
CN		1.044	1.063	1.060	1.070	1.012	0.997	1.013	0.999	0.992	1.001			
CM		0.004	0.004	0.001	0.002	-0.001	-0.004	-0.009	-0.021	-0.010	-0.031			
DCP 1	.010	4.309	4.324	4.322	4.318	4.318	4.322	4.317	3.575	4.320	3.105			
DCP 2	.020	4.612	4.628	4.626	4.622	4.622	4.626	4.460	3.373	4.388	3.167			
DCP 3	.030	4.670	4.686	4.685	4.680	4.680	4.685	4.680	4.120	3.557	4.119			
DCP 4	.049	3.200	3.211	3.210	3.207	2.99	3.060	3.108	2.965	3.106	2.760			
DCP 5	.074	3.453	3.461	3.353	3.422	2.613	2.489	2.600	2.576	2.605	2.506			
DCP 6	.099	2.539	2.596	2.527	2.582	2.364	2.150	2.254	2.316	2.284	2.271			
DCP 7	.149	1.941	1.962	1.909	1.939	1.930	1.974	1.943	1.884	2.058	1.880			
DCP 8	.200	1.838	1.903	1.844	1.892	1.830	1.752	1.709	1.626	1.745	1.627			
DCP 9	.250	1.646	1.730	1.730	1.752	1.664	1.547	1.548	1.538	1.495	1.549			
DCP10	.300	1.318	1.372	1.385	1.416	1.323	1.266	1.291	1.342	1.229	1.337			
DCP11	.399	0.957	0.982	1.014	1.015	0.948	0.957	0.971	1.033	0.938	1.034			
DCP12	.501	0.678	0.692	0.707	0.708	0.681	0.685	0.696	0.735	0.677	0.775			
DCP13	.600	0.479	0.481	0.483	0.479	0.477	0.480	0.497	0.522	0.491	0.570			
DCP14	.701	0.361	0.349	0.355	0.343	0.351	0.357	0.379	0.399	0.384	0.443			
DCP15	.800	0.171	0.171	0.179	0.171	0.176	0.200	0.230	0.262	0.242	0.279			
DCP16	.900	-0.015	-0.006	0.001	0.004	-0.004	0.010	0.033	0.039	0.026	0.057			
DCP17	.969	-0.045	-0.046	-0.045	-0.036	-0.054	-0.036	-0.027	-0.037	-0.036	-0.023			
ALPHA		13.11	13.97	15.02	16.07	17.07	18.05	18.987	20.18					
CN		0.998	0.974	0.983	0.998	0.991	1.007	1.011	1.044					
CM		-0.033	-0.042	-0.052	-0.061	-0.081	-0.089	-0.093	-0.0921					
DCP 1	.010	3.300	2.956	2.921	2.492	2.043	1.944	1.844	2.929					
DCP 2	.020	3.034	2.809	2.888	2.677	2.077	1.996	1.957	3.063					
DCP 3	.030	3.688	3.503	3.311	2.953	2.368	2.196	2.194	2.424					
DCP 4	.049	3.109	2.845	2.889	2.726	2.629	2.813	2.727	2.376					
DCP 5	.074	2.529	2.316	2.243	2.229	2.370	2.397	2.373	2.076					
DCP 6	.099	2.223	2.044	1.909	2.031	2.076	2.067	2.104	1.891					
DCP 7	.149	1.891	1.795	1.755	1.866	1.833	1.815	1.805	1.710					
DCP 8	.200	1.566	1.554	1.575	1.579	1.329	1.332	1.329	1.385					
DCP 9	.250	1.481	1.464	1.448	1.445	1.259	1.264	1.257	1.357					
DCP10	.300	1.293	1.271	1.268	1.282	1.162	1.164	1.170	1.320					
DCP11	.399	1.041	1.017	1.040	1.057	1.047	1.074	1.067	1.165					
DCP12	.501	0.779	0.784	0.797	0.862	0.900	0.958	0.952	0.981					
DCP13	.600	0.569	0.614	0.628	0.675	0.754	0.807	0.822	0.820					
DCP14	.701	0.441	0.486	0.530	0.571	0.667	0.713	0.734	0.702					
DCP15	.800	0.308	0.315	0.387	0.402	0.511	0.530	0.560	0.538					
DCP16	.900	0.071	0.087	0.125	0.138	0.196	0.202	0.218	0.223					
DCP17	.969	-0.021	0.000	-0.003	0.001	0.010	0.015	0.026	0.042					

AIRFOIL NLR 7223-f³ STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.592 Rn = 3.2 x 10⁶

DATA TYPE	X/C	-9.712	-9.191	-6.286	-7.882	-7.315	-6.832	-5.486	-5.435	-5.077	-4.225	-3.524
ALPHA		-9.576	-9.591	-0.587	-9.558	-0.537	-9.495	-0.464	-0.423	-0.376	-0.317	-3.254
CN		0.016	0.008	-0.005	-0.014	-0.023	-0.034	-0.036	-0.042	-0.038	-0.030	-0.027
DCP 1	0.10	-1.563	-1.505	-1.576	-1.546	-1.564	-1.585	-1.666	-1.634	-1.643	-1.745	-1.755
DCP 2	0.20	-1.420	-1.437	-1.482	-1.480	-1.465	-1.488	-1.536	-1.558	-1.547	-1.614	-1.641
DCP 3	0.30	-2.656	-2.776	-2.825	-2.762	-2.777	-2.735	-2.728	-2.695	-2.585	-2.496	-2.387
DCP 4	0.49	-3.870	-0.546	-1.043	-1.335	-1.059	-1.082	-1.093	-1.143	-1.158	-1.197	-1.095
DCP 5	0.74	-1.334	-1.545	-1.587	-1.604	-1.682	-1.839	-1.633	-1.665	-1.653	-1.451	-1.052
DCP 6	0.99	-1.182	-1.393	-1.454	-1.452	-1.544	-1.573	-1.538	-1.539	-1.447	-1.126	-0.763
DCP 7	1.49	-1.101	-1.233	-1.338	-1.299	-1.338	-1.319	-1.258	-1.320	-1.097	-0.606	-0.493
DCP 8	2.00	-1.067	-1.164	-1.237	-1.251	-1.296	-1.199	-1.176	-1.018	-0.735	-0.545	-0.424
DCP 9	2.50	-0.992	-1.086	-1.121	-1.087	-1.082	-1.044	-0.812	-0.750	-0.551	-0.421	-0.345
DCP10	3.00	-0.853	-0.887	-0.867	-0.840	-0.785	-0.685	-0.608	-0.467	-0.418	-0.335	-0.276
DCP11	3.95	-0.755	-0.595	-0.624	-0.558	-0.536	-0.452	-0.375	-0.290	-0.263	-0.233	-0.191
DCP12	5.01	-0.498	-0.474	-0.452	-0.390	-0.330	-0.304	-0.231	-0.201	-0.175	-0.168	-0.157
DCP13	6.00	-0.318	-0.295	-0.276	-0.251	-0.131	-0.111	-0.064	-0.064	-0.062	-0.070	-0.055
DCP14	7.01	-0.095	-0.082	-0.023	0.010	0.024	0.083	0.082	0.121	0.110	0.103	0.115
DCP15	8.00	-0.095	-0.098	-0.007	0.037	0.044	0.100	0.065	0.076	0.072	0.065	0.079
DCP16	9.00	-0.170	-0.118	-0.076	-0.076	-0.049	-0.042	-0.041	-0.066	-0.066	-0.066	-0.094
DCP17	9.69	-0.066	-0.049	-0.025	0.036	-0.012	0.037	0.001	0.026	0.026	-0.001	-0.011

REPRODUCIBILITY OF THE

DATA TYPE	X/C	-3.035	-2.565	-1.671	-1.094	-0.823	-0.152	0.751	1.284	1.555	2.350	3.357
ALPHA		-0.205	-0.136	-0.080	-0.023	0.045	0.106	0.166	0.235	0.295	0.363	0.434
CN		-0.324	-0.025	-0.017	-0.018	-0.020	-0.016	-0.015	-0.014	-0.013	-0.012	-0.013
DCP 1	0.10	-1.737	-1.610	-1.343	-1.103	-0.815	-0.517	-0.285	-0.027	0.237	0.443	0.676
DCP 2	0.20	-1.598	-1.434	-1.155	-0.801	-0.574	-0.360	-0.173	-0.002	0.237	0.440	0.634
DCP 3	0.30	-2.285	-1.633	-1.062	-0.795	-0.616	-0.344	-0.074	0.264	0.558	0.837	1.165
DCP 4	0.49	-0.683	-0.495	-0.392	-0.240	-0.118	0.021	0.165	0.345	0.493	0.635	0.817
DCP 5	0.74	-0.718	-0.506	-0.311	-0.124	0.060	0.257	0.480	0.705	0.924	1.135	1.414
DCP 6	0.99	-0.526	-0.391	-0.234	-0.034	0.141	0.285	0.472	0.685	0.855	1.043	1.287
DCP 7	1.49	-0.403	-0.263	-0.156	-0.051	0.115	0.246	0.356	0.504	0.675	0.830	1.058
DCP 8	2.00	-0.385	-0.257	-0.185	-0.064	0.001	0.163	0.278	0.391	0.441	0.596	0.708
DCP 9	2.50	-0.270	-0.211	-0.102	-0.026	0.079	0.184	0.261	0.365	0.459	0.544	0.636
DCP10	3.00	-0.202	-0.134	-0.073	0.013	0.073	0.175	0.253	0.315	0.397	0.478	0.545
DCP11	3.94	-0.158	-0.071	-0.033	0.012	0.084	0.152	0.233	0.274	0.328	0.390	0.465
DCP12	5.01	-0.136	-0.074	-0.020	0.025	0.065	0.107	0.158	0.207	0.234	0.294	0.336
DCP13	6.00	-0.123	0.007	0.038	0.067	0.095	0.144	0.175	0.202	0.235	0.275	0.300
DCP14	7.01	0.131	0.144	0.153	0.174	0.214	0.205	0.254	0.265	0.276	0.210	0.212
DCP15	8.00	0.054	0.085	0.062	0.072	0.102	0.102	0.086	0.107	0.140	0.121	0.143
DCP16	9.00	-0.084	-0.083	-0.131	-0.135	-0.107	-0.111	-0.086	-0.107	-0.142	-0.133	-0.092
DCP17	9.69	-0.017	0.017	-0.021	-0.024	-0.022	-0.063	-0.058	-0.052	-0.036	-0.057	-0.046

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE		X/C	M = 0.592 Re = 3.2 x 10 ⁶														FLOOR AND CEILING WITH 4.9% POROSITY			
ALPHA	3.580	4.115	4.885	5.693	5.837	6.545	7.553	7.823	8.448	9.165	9.544	9.544	0.917	0.000						
	0.495	0.545	0.600	0.684	0.755	0.803	0.832	0.844	0.884	0.887	0.917									
	-0.012	-0.008	-0.035	-0.000	0.002	0.004	0.012	0.014	0.008	0.010	0.000									
	0.916	1.140	1.315	1.515	1.771	1.895	1.555	2.075	2.154	2.214	2.263									
	0.790	1.002	1.166	1.268	1.430	1.651	1.785	1.847	1.965	2.059	2.081									
	1.452	1.703	1.918	2.117	2.315	2.588	2.853	3.000	3.147	3.283	3.366									
	0.995	1.173	1.285	1.411	1.507	1.562	1.683	1.782	1.864	1.828	1.854									
	1.678	1.572	2.237	2.454	2.625	2.708	2.838	2.927	2.617	2.857	2.811									
	1.521	1.761	2.062	2.351	2.581	2.657	2.716	2.725	2.735	2.505	2.426									
	0.913	0.588	1.106	1.865	2.282	2.442	2.398	2.134	2.075	2.092	2.136									
0.785	0.892	0.950	0.566	1.123	1.454	1.680	1.758	1.768	1.757	1.695	1.665	1.247	1.665							
0.737	0.801	0.855	0.902	0.555	1.028	1.224	1.406	1.505	1.582	1.556	1.256	1.256	1.256							
0.642	0.721	0.772	0.806	0.705	0.733	0.856	0.943	1.059	1.173	1.256	1.256	1.256	1.256							
0.534	0.565	0.594	0.655	0.705	0.733	0.856	0.943	1.059	1.173	1.256	1.256	1.256	1.256							
0.398	0.438	0.446	0.501	0.534	0.515	0.534	0.548	0.572	0.572	0.577	0.577	0.577	0.577							
0.355	0.358	0.375	0.418	0.445	0.449	0.449	0.414	0.427	0.427	0.449	0.449	0.449	0.449							
0.348	0.371	0.375	0.360	0.356	0.395	0.395	0.364	0.321	0.334	0.315	0.315	0.315	0.315							
0.146	0.140	0.166	0.176	0.159	0.176	0.176	0.155	0.133	0.152	0.119	0.119	0.158	0.158							
-0.124	-0.124	-0.118	-0.127	-0.116	-0.087	-0.087	-0.098	-0.065	-0.086	-0.096	-0.096	-0.327	-0.327							
-0.061	-0.086	-0.089	-0.083	-0.080	-0.076	-0.076	-0.081	-0.081	-0.060	-0.077	-0.077	-0.030	-0.030							

DATA TYPE		X/C													
ALPHA	10.214	10.806	11.651	12.259	12.544	13.115	14.012	14.517	15.061	15.504	16.226				
	0.536	0.906	0.915	0.932	0.904	0.832	0.824	0.814	0.841	0.849	0.857				
	-0.013	-0.025	-0.045	-0.060	-0.074	-0.071	-0.079	-0.074	-0.077	-0.076	-0.075				
DCP 1	2.267	2.293	1.971	1.811	1.482	1.244	1.125	1.150	1.146	1.115	1.112				
DCP 2	2.121	2.594	1.833	1.616	1.367	1.136	1.042	1.003	1.037	1.035	1.037				
DCP 3	3.337	3.255	2.773	2.666	2.096	1.836	1.710	1.662	1.644	1.637	1.675				
DCP 4	1.828	1.672	1.657	1.667	1.741	1.700	1.677	1.602	1.597	1.562	1.570				
DCP 5	2.680	2.501	2.481	2.448	2.472	2.465	2.484	2.452	2.472	2.449	2.495				
DCP 6	2.381	2.133	2.163	2.156	2.281	2.242	2.231	2.193	2.264	2.255	2.353				
DCP 7	2.070	1.894	1.732	1.733	1.607	1.402	1.237	1.310	1.419	1.457	1.435				
DCP 8	1.821	1.665	1.471	1.424	1.143	0.554	0.943	1.022	1.006	1.117	1.055				
DCP 9	1.553	1.483	1.326	1.347	1.165	1.057	0.581	0.598	1.035	1.040	1.027				
DCP10	1.267	1.260	1.166	1.173	1.042	0.949	0.916	0.889	0.930	0.925	0.978				
DCP11	0.568	0.951	1.050	1.027	1.020	0.890	0.845	0.847	0.891	0.925	0.898				
DCP12	0.716	0.691	0.805	0.846	0.830	0.730	0.744	0.757	0.780	0.777	0.788				
DCP13	0.510	0.533	0.641	0.682	0.740	0.668	0.673	0.673	0.692	0.687	0.714				
DCP14	0.405	0.406	0.535	0.605	0.645	0.645	0.657	0.620	0.675	0.667	0.658				
DCP15	0.197	0.265	0.376	0.385	0.465	0.501	0.553	0.514	0.532	0.507	0.524				
DCP16	-0.007	0.048	0.055	0.075	0.154	0.160	0.177	0.168	0.164	0.164	0.162				
DCP17	-0.023	-0.024	-0.011	0.020	0.016	-0.029	-0.005	-0.014	0.006	-0.017	-0.017				
DCP18															
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REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CRILING WITH 4.9% POROSITY

M = 0.592 Re = 3.2×10^6

DATA TYPE	X/C	16.865 C.878 -3.075	17.408 3.911 -0.083	17.560 3.932 -3.091	18.862 0.952 -0.091	19.336 6.585 -0.096	19.512 0.587 -3.097
ALPHA							
CN							
CM							
DCP 1	.010	1.145	1.152	1.147	1.152	1.184	1.189
DCP 2	.020	1.028	1.071	1.089	1.102	1.095	1.119
DCP 3	.030	1.711	1.731	1.736	1.610	1.830	1.814
DCP 4	.040	1.625	1.631	1.567	1.495	1.512	1.477
DCP 5	.074	2.471	2.527	2.534	2.487	2.486	2.441
DCP 6	.099	2.405	2.424	2.387	2.450	2.518	2.461
DCP 7	.149	1.585	1.740	1.786	1.805	1.570	2.080
DCP 8	.200	1.086	1.155	1.137	1.251	1.297	1.243
DCP 9	.250	1.088	1.125	1.146	1.185	1.225	1.235
DCP 10	.300	3.593	1.041	1.043	1.104	1.135	1.136
DCP 11	.399	3.917	3.537	0.575	1.025	1.057	1.066
DCP 12	.501	0.811	0.835	0.876	0.885	3.517	0.911
DCP 13	.600	3.725	0.735	3.763	0.802	3.757	3.819
DCP 14	.701	0.669	3.688	0.727	3.736	6.755	3.740
DCP 15	.800	0.544	0.562	3.586	0.594	3.603	3.603
DCP 16	.900	3.122	0.190	0.226	3.230	0.243	3.257
DCP 17	.969	-0.008	-3.330	0.025	3.012	0.016	0.004

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

$$M = 0.594 \text{ } \mu\text{m} = 6.3 \times 10^6$$

DATA TYPE		X/C		M = 0.594 Rn = 6.3 x 10 ⁶												FLOOR AND CEILING WITH 4.9% POROSITY																																																																																																																																																																																																																																									
ALPHA	-9.525	-5.528	-8.253	-7.742	-7.127	-6.253	-5.565	-5.341	-4.820	-4.016	-3.568	CM	3.015	-0.671	-0.573	-0.495	-0.465	-0.435	-0.366	-0.314	-0.262	-0.232	-3.568	-3.262																																																																																																																																																																																																																																	
	0.007	-0.016	-0.028	-0.032	-0.040	-0.038	-0.036	-0.031	-0.026	-0.022	-0.015																																																																																																																																																																																																																																														
OCIP 1	-2.076	-1.931	-1.777	-2.137	-1.697	-1.742	-1.669	-1.780	-1.675	-2.002	-2.021	OCIP 2	OCIP 3	-1.608	-1.608	-1.619	-1.552	-1.760	-1.807	-1.747	-1.747	OCIP 4	OCIP 5	OCIP 6	OCIP 7	OCIP 8	OCIP 9	OCIP 10	OCIP 11	OCIP 12	OCIP 13	OCIP 14	OCIP 15	OCIP 16	OCIP 17	OCIP 18	OCIP 19	OCIP 20	OCIP 21	OCIP 22	OCIP 23	OCIP 24	OCIP 25	OCIP 26	OCIP 27	OCIP 28	OCIP 29	OCIP 30	OCIP 31	OCIP 32	OCIP 33	OCIP 34	OCIP 35	OCIP 36	OCIP 37	OCIP 38	OCIP 39	OCIP 40	OCIP 41	OCIP 42	OCIP 43	OCIP 44	OCIP 45	OCIP 46	OCIP 47	OCIP 48	OCIP 49	OCIP 50	OCIP 51	OCIP 52	OCIP 53	OCIP 54	OCIP 55	OCIP 56	OCIP 57	OCIP 58	OCIP 59	OCIP 60	OCIP 61	OCIP 62	OCIP 63	OCIP 64	OCIP 65	OCIP 66	OCIP 67	OCIP 68	OCIP 69	OCIP 70	OCIP 71	OCIP 72	OCIP 73	OCIP 74	OCIP 75	OCIP 76	OCIP 77	OCIP 78	OCIP 79	OCIP 80	OCIP 81	OCIP 82	OCIP 83	OCIP 84	OCIP 85	OCIP 86	OCIP 87	OCIP 88	OCIP 89	OCIP 90	OCIP 91	OCIP 92	OCIP 93	OCIP 94	OCIP 95	OCIP 96	OCIP 97	OCIP 98	OCIP 99	OCIP 100	OCIP 101	OCIP 102	OCIP 103	OCIP 104	OCIP 105	OCIP 106	OCIP 107	OCIP 108	OCIP 109	OCIP 110	OCIP 111	OCIP 112	OCIP 113	OCIP 114	OCIP 115	OCIP 116	OCIP 117	OCIP 118	OCIP 119	OCIP 120	OCIP 121	OCIP 122	OCIP 123	OCIP 124	OCIP 125	OCIP 126	OCIP 127	OCIP 128	OCIP 129	OCIP 130	OCIP 131	OCIP 132	OCIP 133	OCIP 134	OCIP 135	OCIP 136	OCIP 137	OCIP 138	OCIP 139	OCIP 140	OCIP 141	OCIP 142	OCIP 143	OCIP 144	OCIP 145	OCIP 146	OCIP 147	OCIP 148	OCIP 149	OCIP 150	OCIP 151	OCIP 152	OCIP 153	OCIP 154	OCIP 155	OCIP 156	OCIP 157	OCIP 158	OCIP 159	OCIP 160	OCIP 161	OCIP 162	OCIP 163	OCIP 164	OCIP 165	OCIP 166	OCIP 167	OCIP 168	OCIP 169	OCIP 170	OCIP 171	OCIP 172	OCIP 173	OCIP 174	OCIP 175	OCIP 176	OCIP 177	OCIP 178	OCIP 179	OCIP 180	OCIP 181	OCIP 182	OCIP 183	OCIP 184	OCIP 185	OCIP 186	OCIP 187	OCIP 188	OCIP 189	OCIP 190	OCIP 191	OCIP 192	OCIP 193	OCIP 194	OCIP 195	OCIP 196	OCIP 197	OCIP 198	OCIP 199	OCIP 200	OCIP 201	OCIP 202	OCIP 203	OCIP 204	OCIP 205	OCIP 206	OCIP 207	OCIP 208	OCIP 209	OCIP 210	OCIP 211	OCIP 212	OCIP 213	OCIP 214	OCIP 215	OCIP 216	OCIP 217	OCIP 218	OCIP 219	OCIP 220	OCIP 221	OCIP 222	OCIP 223	OCIP 224	OCIP 225	OCIP 226	OCIP 227	OCIP 228	OCIP 229	OCIP 230	OCIP 231

[illegible]

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.594 $R_n = 6.3 \times 10^6$

FLOOR AND CEILING WITH 4.9% POROSITY

DATA TYPE	X/C	3.647 C 514 -0.012	4.318 0.582 -0.005	5.186 0.631 -0.006	5.457 0.711 -0.004	5.673 0.771 -0.000	6.784 3.828 0.002	7.601 0.871 3.508	7.874 0.901 0.013	8.336 0.886 3.016	9.215 0.906 0.013	9.932 0.892 0.011
ALPHA												
CM												
DCP 1	-0.10	0.923	1.134	1.328	1.552	1.768	1.927	2.021	2.103	2.163	2.191	2.228
DCP 2	-0.20	0.845	1.019	1.163	1.306	1.480	1.716	1.836	1.937	2.006	2.054	2.091
DCP 3	-0.30	1.486	1.734	2.149	2.149	2.303	2.713	2.950	3.115	3.211	3.302	3.377
DCP 4	-0.49	1.033	1.182	1.306	1.416	1.472	1.631	1.722	1.827	1.893	1.931	1.948
DCP 5	-0.74	1.746	2.045	2.311	2.507	2.605	2.750	2.921	3.069	3.146	3.146	3.072
DCP 6	-0.99	1.597	2.365	2.365	2.580	2.699	2.828	2.977	3.078	2.989	2.990	2.985
DCP 7	-1.49	1.035	1.104	1.104	1.875	2.438	2.591	2.676	2.554	2.215	2.176	2.082
DCP 8	-2.00	0.838	0.955	0.997	0.995	1.121	1.423	1.654	1.742	1.825	1.833	1.802
DCP 9	-2.50	0.738	0.825	0.884	0.914	0.911	0.586	1.171	1.391	1.386	1.463	1.526
DCP10	-3.00	0.660	0.736	0.777	0.813	0.853	0.832	0.832	1.032	1.083	1.177	1.183
DCP11	-3.99	0.541	0.620	0.642	0.683	0.708	0.754	0.764	0.762	0.792	0.827	0.862
DCP12	-5.01	0.393	0.437	0.475	0.516	0.528	0.565	0.564	0.570	0.532	0.548	0.565
DCP13	-6.00	0.351	0.379	0.411	0.418	0.443	0.463	0.460	0.451	0.413	0.423	0.415
DCP14	-7.01	0.350	0.367	0.368	0.396	0.407	0.398	0.395	0.361	0.339	0.315	0.306
DCP15	-8.00	0.161	0.162	0.175	0.195	0.198	0.230	0.196	0.170	0.153	0.156	0.165
DCP16	-9.00	-0.087	-0.105	-0.119	-0.099	-0.093	-0.076	-0.086	-0.091	-0.097	-0.065	-0.062
DCP17	-9.69	-0.092	-0.080	-0.072	-0.083	-0.078	-0.073	-0.083	-0.087	-0.076	-0.067	-0.108

DATA TYPE	X/C	10.275 0.902 0.000	10.655 0.898 -0.006	11.600 0.536 -0.025	12.432 0.928 -0.041	12.608 0.965 -0.064	13.172 3.942 -0.068	14.078 0.921 -0.075	14.820 3.865 -0.083	15.038 0.850 -0.083	15.615 3.886 -0.091	16.221 0.927 -0.093
ALPHA												
CM												
DCP 1	-0.10	2.268	2.297	2.274	2.160	1.557	1.774	1.955	2.082	2.103	2.125	2.144
DCP 2	-0.20	2.139	2.170	2.139	1.580	1.786	1.594	1.880	2.104	2.088	2.045	2.023
DCP 3	-0.30	3.417	3.318	3.258	3.235	2.585	2.678	3.343	3.401	3.224	2.553	2.956
DCP 4	-0.49	1.901	1.735	1.765	1.631	1.715	1.636	1.685	1.626	1.611	1.620	1.665
DCP 5	-0.74	2.757	2.477	2.602	2.454	2.580	2.546	2.616	1.955	2.057	2.260	2.481
DCP 6	-0.99	2.375	2.295	2.294	2.283	2.406	2.337	2.374	1.409	1.371	1.413	1.503
DCP 7	-1.49	2.052	2.090	1.930	1.677	1.667	1.631	1.357	1.246	1.200	1.238	1.316
DCP 8	-2.00	1.788	1.770	1.625	1.383	1.394	1.205	1.114	1.139	1.096	1.142	1.219
DCP 9	-2.50	1.565	1.456	1.418	1.411	1.265	1.205	1.011	1.082	1.026	1.072	1.154
DCP10	-3.00	1.225	1.233	1.268	1.275	1.160	1.156	1.015	1.031	0.994	1.047	1.084
DCP11	-3.99	0.946	1.011	1.075	1.132	1.117	0.935	0.937	0.917	0.937	0.945	1.012
DCP12	-5.01	0.629	0.635	0.763	0.792	0.502	0.925	0.867	0.831	0.757	0.824	0.882
DCP13	-6.00	0.414	0.458	0.584	0.605	0.700	0.704	0.713	0.705	0.658	0.800	0.852
DCP14	-7.01	0.320	0.345	0.420	0.491	0.613	0.554	0.644	0.685	0.616	0.680	0.605
DCP15	-8.00	0.184	0.184	0.223	0.310	0.386	0.445	0.516	0.499	0.488	0.538	0.585
DCP16	-9.00	-0.025	-0.028	-0.042	-0.071	-0.170	-0.172	-0.241	-0.234	-0.313	-0.275	-0.284
DCP17	-9.69	-0.066	-0.057	-0.040	-0.057	-0.066	-0.004	-0.051	-0.088	-0.097	-0.056	-0.066

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.594 $R_n = 6.3 \times 10^6$ FLOOR AND CEILING WITH 4.9% POROSITY

CATA TYPE	X/C								
ALPHA		17.66C	17.356	18.048	18.665	19.471	19.856		
CN		0.906	0.929	0.946	0.943	1.035	0.995		
CM		-0.092	-0.096	-0.095	-0.092	-0.106	-0.105		
DCP 1	0.10	2.125	2.157	2.177	2.190	2.261	2.187		
DCP 2	0.020	1.95C	2.026	2.00C	2.066	2.045	2.025		
CCP 3	0.30	2.863	2.946	2.864	2.892	2.883	2.825		
DCP 4	0.49	1.64C	1.664	1.682	1.681	1.732	1.708		
DCP 5	0.74	2.506	2.62C	2.721	2.753	2.880	2.851		
DCP 6	0.99	1.464	1.464	1.496	1.541	1.594	1.624		
DCP 7	1.49	1.248	1.285	1.212	1.351	1.398	1.358		
DCP 8	2.00	1.185	1.21C	1.250	1.25C	1.330	1.305		
DCP 9	2.50	1.132	1.11C	1.156	1.183	1.237	1.251		
DCP10	3.00	1.034	1.070	1.101	1.104	1.146	1.168		
DCP11	3.99	0.887	1.00C	1.033	0.995	1.076	1.081		
DCP12	5.01	0.804	0.853	0.896	0.907	0.986	0.946		
DCP13	6.00	0.762	0.820	0.832	0.737	0.892	0.836		
DCP14	7.31	0.753	0.704	0.740	0.695	0.771	0.835		
DCP15	8.00	0.579	0.596	0.582	0.605	0.619	0.625		
DCP16	9.0C	0.241	0.301	0.260	0.271	0.318	0.281		
DCP17	9.69	0.074	0.067	0.033	0.062	0.075	0.065		

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.597 Rn = 9.4 x 10⁶

CATA
TYPE X/C

CATA TYPE	X/C	-6.647	-8.152	-7.394	-7.197	-6.582	-5.785	-5.041	-4.676	-4.04C	-3.412	-2.512
ALPHA		-0.662	-0.630	-0.563	-0.577	-0.522	-0.482	-0.457	-0.437	-0.350	-0.296	-0.237
CM		-0.015	-0.027	-0.040	-0.045	-0.05L	-0.045	-0.044	-0.041	-0.035	-0.03C	-0.027
DCP 1	.013	-2.693	-2.696	-3.03E	-3.216	-3.145	-3.275	-3.268	-3.374	-3.337	-3.401	-3.414
DCP 2	.020	-3.075	-2.941	-3.225	-3.017	-3.060	-3.047	-2.836	-3.011	-3.015	-3.018	-2.577
DCP 3	.030	-2.655	-2.633	-2.616	-2.662	-2.662	-2.572	-2.694	-2.708	-2.491	-2.32C	-1.804
DCP 4	.049	-2.329	-2.264	-1.992	-2.466	-2.394	-2.224	-2.224	-2.237	-1.932	-1.554	-1.046
DCP 5	.074	-1.880	-1.931	-1.814	-2.125	-2.043	-1.974	-1.817	-1.582	-1.282	-0.855	-0.662
DCP 6	.099	-1.737	-1.732	-1.657	-1.762	-1.63C	-1.701	-1.525	-1.202	-0.841	-0.477	-0.477
DCP 7	.149	-1.301	-1.392	-1.570	-1.402	-1.241	-1.142	-1.114	-0.797	-0.60C	-0.461	-0.406
DCP 8	.200	-1.116	-1.147	-1.084	-1.138	-0.991	-0.865	-0.564	-0.518	-0.346	-0.274	-0.350
DCP 9	.253	-1.176	-1.057	-0.902	-0.935	-0.715	-0.604	-0.443	-0.455	-0.405	-0.27C	-0.184
DCP10	.300	-0.578	-0.855	-0.642	-0.695	-0.562	-0.305	-0.472	-0.355	-0.321	-0.184	-0.136
DCP11	.395	-0.455	-0.625	-0.416	-0.426	-0.375	-0.227	-0.214	-0.273	-0.162	-0.05C	-0.05C
DCP12	.501	-0.415	-0.384	-0.313	-0.260	-0.242	-0.106	-0.106	-0.095	-0.075	-0.06C	-0.036
DCP13	.600	-0.28C	-0.229	-0.144	-0.117	-0.108	0.092	0.076	0.081	0.07C	0.082	0.101
DCP14	.701	-0.025	-0.036	0.046	0.062	0.058	0.055	0.04C	0.035	0.04C	0.031	0.027
DCP15	.800	-0.028	0.017	0.045	0.045	0.058	0.032	-0.032	-0.069	-0.086	-0.057	-0.107
DCP16	.900	-0.065	-0.06C	-0.041	-0.021	-0.021	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032
DCP17	.969	-0.015	-0.017	-0.017	0.008	0.012	-0.014	-0.032	-0.032	-0.032	-0.032	-0.032

CATA
TYPE X/C

CATA TYPE	X/C	-2.356	-1.647	-1.152	-0.321	0.201	0.591	1.22C	2.157	2.505	3.031	3.854
ALPHA		-0.18C	-0.112	-0.042	0.031	0.113	0.175	0.250	0.322	0.396	0.468	0.535
CM		-0.022	-0.021	-0.018	-0.016	-0.017	-0.015	-0.014	-0.012	-0.011	-0.005	-0.006
DCP 1	.010	-3.385	-2.821	-2.051	-1.537	-0.917	-0.371	-0.268	0.112	0.612	1.02C	1.265
DCP 2	.020	-2.202	-1.551	-1.265	-0.504	-0.962	-0.215	0.125	0.452	0.78C	1.114	1.435
DCP 3	.030	-1.306	-1.142	-0.855	-0.556	-0.265	0.012	0.312	0.61C	0.905	1.191	1.472
DCP 4	.049	-0.657	-0.657	-0.421	-0.175	0.103	0.331	0.586	0.850	1.134	1.415	1.717
DCP 5	.074	-0.515	-0.335	-0.142	0.074	0.276	0.493	0.737	0.955	1.195	1.434	1.722
DCP 6	.099	-0.336	-0.176	-0.025	0.168	0.350	0.540	0.726	0.927	1.126	1.322	1.552
DCP 7	.14	-0.284	-0.154	-0.027	0.085	0.236	0.376	0.516	0.642	0.792	0.925	1.053
DCP 8	.200	-0.284	-0.154	-0.056	0.085	0.236	0.376	0.516	0.642	0.792	0.925	1.053
DCP 9	.250	-0.192	-0.117	-0.017	0.076	0.177	0.282	0.41C	0.524	0.632	0.733	0.834
DCP10	.300	-0.14C	-0.054	0.026	0.115	0.191	0.24C	0.364	0.462	0.553	0.646	0.734
DCP11	.349	-0.075	-0.028	0.041	0.131	0.161	0.233	0.292	0.360	0.436	0.501	0.558
DCP12	.501	-0.072	-0.007	0.027	0.076	0.125	0.155	0.211	0.264	0.327	0.380	0.425
DCP13	.600	-0.014	0.007	0.052	0.076	0.117	0.157	0.208	0.237	0.267	0.301	0.337
DCP14	.701	0.121	0.145	0.162	0.187	0.230	0.261	0.264	0.256	0.219	0.162	0.106
DCP15	.800	0.037	0.048	0.061	0.065	0.091	0.101	0.122	0.122	0.151	0.163	0.175
DCP16	.900	-0.117	-0.120	-0.125	-0.124	-0.114	-0.111	-0.124	-0.102	-0.106	-0.105	-0.094
DCP17	.965	-0.036	-0.045	-0.064	-0.05C	-0.045	-0.062	-0.062	-0.062	-0.064	-0.077	-0.082

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE	X/C	M = 0.597 Rn = 9.4 x 10 ⁶															
		FLOOR AND CEILING WITH 4.9% POROSITY															
ALPHA		4.591	4.487	5.495	6.156	7.053	7.258	8.016	8.554	9.288	9.524	10.224					
CN		0.616	0.670	0.736	0.808	0.884	0.930	0.968	0.946	0.996	0.983	0.979					
CM		-0.004	-0.001	0.001	0.006	0.014	0.018	0.024	0.027	0.023	0.014	-0.001					
DCP 1	0.010	1.825	1.951	2.440	2.742	3.064	3.137	3.508	3.297	3.372	3.553	3.481					
DCP 2	0.020	1.724	1.985	2.224	2.552	2.918	3.132	3.297	3.403	3.490	3.516	3.631					
DCP 3	0.030	1.725	1.952	2.111	2.312	2.757	2.984	3.140	3.246	3.353	3.434	3.509					
DCP 4	0.049	1.566	2.203	2.375	2.465	2.532	2.537	2.547	2.546	2.559	2.563	2.573					
DCP 5	0.074	1.587	2.278	2.468	2.593	2.731	2.928	3.070	3.180	3.292	3.353	3.416					
DCP 6	0.099	2.022	2.553	2.575	2.705	2.844	2.999	3.123	3.219	3.252	3.076	2.801					
DCP 7	0.149	1.159	1.113	1.501	2.028	2.631	2.741	2.781	2.385	2.235	1.915	1.650					
DCP 8	0.200	0.931	1.002	1.005	1.277	1.562	1.788	1.960	1.906	1.608	1.585	1.428					
DCP 9	0.250	0.811	0.691	0.922	0.941	1.027	1.201	1.365	1.367	1.677	1.579	1.497					
DCP10	0.300	0.736	0.781	0.837	0.856	0.853	0.902	0.983	0.993	1.408	1.295	1.267					
DCP11	0.399	0.598	0.649	0.697	0.738	0.759	0.766	0.808	0.830	0.960	1.058	1.070					
DCP12	0.501	0.438	0.490	0.515	0.549	0.564	0.576	0.568	0.595	0.641	0.615	0.729					
DCP13	0.603	0.380	0.400	0.430	0.446	0.456	0.445	0.441	0.395	0.434	0.444	0.478					
DCP14	0.701	0.362	0.357	0.408	0.407	0.410	0.391	0.341	0.303	0.295	0.306	0.370					
DCP15	0.800	0.177	0.183	0.191	0.196	0.188	0.195	0.167	0.148	0.130	0.165	0.228					
DCP16	0.900	-0.096	-0.102	-0.093	-0.082	-0.086	-0.075	-0.074	-0.084	-0.097	-0.055	0.004					
DCP17	0.969	-0.075	-0.085	-0.075	-0.078	-0.078	-0.093	-0.058	-0.090	-0.066	-0.318	-0.604					

DATA TYPE	X/C	M = 0.597 Rn = 9.4 x 10 ⁶															
		FLOOR AND CEILING WITH 4.9% POROSITY															
ALPHA		10.757	11.772	12.074	12.754	13.204	13.531	14.665	15.240	15.761	16.402	17.127					
CN		0.557	1.001	0.955	0.965	0.568	0.586	0.994	0.997	0.935	0.585	1.000					
CM		-0.011	-0.019	-0.025	-0.027	-0.034	-0.045	-0.035	-0.065	-0.063	-0.086	-0.091					
DCP 1	0.010	3.574	3.572	3.551	3.387	3.254	2.596	3.051	2.701	3.133	1.874	1.845					
DCP 2	0.020	3.700	3.774	3.755	3.495	3.484	3.181	3.215	2.777	3.022	1.551	1.783					
DCP 3	0.030	3.603	3.656	3.738	3.589	3.557	3.349	3.546	3.024	2.755	2.052	2.524					
DCP 4	0.049	2.593	2.564	2.525	2.292	2.301	2.174	2.432	2.229	2.521	2.498	2.531					
DCP 5	0.074	3.403	3.029	2.780	2.314	2.236	2.131	2.352	2.161	2.193	2.411	2.531					
DCP 6	0.099	2.609	2.495	2.292	2.172	2.112	2.051	2.214	2.102	1.680	2.327	2.327					
DCP 7	0.149	1.654	1.687	1.465	1.748	1.696	1.712	1.556	1.741	1.479	1.814	1.853					
DCP 8	0.200	1.485	1.471	1.316	1.505	1.440	1.481	1.262	1.361	1.271	1.156	1.170					
DCP 9	0.250	1.430	1.491	1.374	1.461	1.430	1.552	1.310	1.375	1.218	1.191	1.130					
DCP10	0.300	1.294	1.243	1.175	1.292	1.249	1.375	1.172	1.221	1.173	1.135	1.097					
DCP11	0.399	0.991	1.092	1.056	0.747	0.815	0.891	1.034	1.125	0.984	1.041	1.023					
DCP12	0.501	0.800	0.782	0.771	0.747	0.815	0.891	0.872	0.865	0.839	0.904	0.903					
DCP13	0.603	0.570	0.562	0.585	0.601	0.584	0.654	0.815	0.793	0.737	0.816	0.806					
DCP14	0.701	0.415	0.439	0.455	0.467	0.542	0.502	0.583	0.621	0.555	0.718	0.770					
DCP15	0.800	0.261	0.269	0.298	0.278	0.333	0.344	0.435	0.474	0.468	0.545	0.655					
DCP16	0.900	0.012	0.081	0.063	0.062	0.069	0.086	0.155	0.118	0.157	0.232	0.214					
DCP17	0.969	-0.006	-0.002	0.025	-0.001	-0.057	-0.006	0.028	-0.003	0.009	0.042	0.028					

REPRODUCIBILITY OF THE
ORIGINAL PAGE

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.597 Rn = 9.4×10^6 FLOOR AND CEILING WITH 4.9% POROSITY

DATA TYPE	X/C	17.621	18.054	19.457	20.153
ALPHA		1.002	1.002	1.032	1.056
CN		-0.091	-0.084	-0.085	-0.093
DCP 1	-0.10	1.845	1.875	1.857	2.168
DCP 2	-0.20	1.792	1.803	1.824	2.165
DCP 3	-0.30	2.001	1.945	1.875	2.407
DCP 4	-0.40	2.542	2.565	2.560	2.324
DCP 5	-0.50	2.502	2.547	2.570	2.281
DCP 6	-0.60	2.350	2.340	2.377	2.138
DCP 7	-0.70	1.954	2.112	2.162	1.987
DCP 8	-0.80	1.198	1.186	1.287	1.395
DCP 9	-0.90	1.139	1.147	1.205	1.380
DCP 10	-1.00	1.070	1.082	1.135	1.277
DCP 11	-1.10	1.004	1.027	1.058	1.123
DCP 12	-1.20	0.925	0.865	0.922	0.991
DCP 13	-1.30	0.846	0.806	0.820	0.870
DCP 14	-1.40	0.752	0.739	0.755	0.773
DCP 15	-1.50	0.627	0.612	0.624	0.593
DCP 16	-1.60	0.235	0.222	0.232	0.205
DCP 17	-1.70	0.036	-0.301	0.019	0.027

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	M = 0.593		Rn = 9.4 x 10 ⁶		FLOOR AND CEILING WITH 4.9% POROSITY									
		ALPHA	1.756	2.363	3.035	3.761	4.445	4.781	5.413	5.567	6.685				
OCN		0.244	0.316	0.385	0.466	0.544	0.618	0.681	0.750	0.807	0.882				
CM		-0.014	-0.014	-0.012	-0.012	-0.010	-0.005	-0.003	-0.001	0.005	0.018				
DCP 1	-0.010	-0.081	0.324	0.734	1.096	1.492	1.686	2.252	2.594	3.030	3.457				
DCP 2	-0.020	0.039	0.395	1.067	1.393	1.705	1.994	2.252	2.493	2.943	3.186				
DCP 3	-0.030	0.264	0.541	1.164	1.466	1.740	1.980	2.165	2.350	2.772	3.014				
DCP 4	-0.049	0.549	0.814	1.085	1.374	1.695	1.988	2.232	2.488	2.971	3.260				
DCP 5	-0.074	0.695	0.917	1.157	1.405	1.705	1.978	2.285	2.474	2.767	2.970				
DCP 6	-0.099	0.658	0.880	1.085	1.314	1.552	1.987	2.341	2.563	2.837	2.996				
DCP 7	-0.149	0.518	0.635	0.746	0.895	1.043	1.133	1.543	1.543	2.647	2.701				
DCP 8	-0.200	0.384	0.497	0.620	0.730	0.835	0.934	0.991	1.166	1.424	1.474				
DCP 9	-0.250	0.350	0.454	0.552	0.639	0.728	0.822	0.869	0.951	0.990	1.192				
DCP10	-0.300	0.335	0.418	0.496	0.573	0.657	0.724	0.802	0.840	0.863	0.886				
DCP11	-0.350	0.288	0.334	0.408	0.478	0.534	0.594	0.655	0.705	0.762	0.786				
DCP12	-0.501	0.226	0.273	0.326	0.352	0.415	0.466	0.508	0.530	0.586	0.595				
DCP13	-0.607	0.208	0.237	0.272	0.330	0.385	0.398	0.426	0.454	0.478	0.478				
DCP14	-0.701	0.264	0.308	0.311	0.347	0.373	0.385	0.405	0.416	0.434	0.416				
DCP15	-0.800	0.116	0.140	0.148	0.174	0.186	0.182	0.190	0.196	0.207	0.180				
DCP16	-0.900	-0.125	-0.124	-0.105	-0.095	-0.104	-0.109	-0.104	-0.080	-0.075	-0.075				
DCP17	-0.969	-0.066	-0.062	-0.071	-0.083	-0.086	-0.081	-0.078	-0.063	-0.059	-0.059				

CATA TYPE	X/C	8.105	6.484	9.081	9.710	10.182	11.045	11.676	11.566	12.575	13.213	13.826
ALPHA		0.597	1.006	1.031	1.027	1.036	1.021	1.010	0.928	1.022	1.003	0.576
CN		0.024	0.026	0.024	0.015	-0.002	-0.014	-0.010	-0.012	-0.033	-0.043	-0.033
OCM												
OC1	010	3.605	3.715	3.787	3.826	3.873	3.683	3.651	4.063	3.761	3.704	3.925
OC2	020	3.342	3.475	3.571	3.624	3.695	3.739	3.765	3.613	3.803	3.741	3.742
OC3	030	3.192	3.325	3.407	3.466	3.538	3.615	3.668	3.206	3.664	3.567	3.334
OC4	040	3.142	3.267	3.358	3.417	3.467	3.504	3.467	3.453	3.202	2.961	2.724
OC5	050	3.133	3.240	3.313	3.367	3.407	3.240	2.889	2.106	2.629	2.540	2.336
OC6	060	3.146	3.236	3.249	3.285	2.835	2.601	2.505	1.556	2.389	2.337	1.918
OC7	070	2.885	2.531	2.252	1.586	1.763	1.578	1.532	1.755	1.586	1.735	1.613
OC8	080	1.712	1.788	1.613	1.561	1.472	1.390	1.353	1.592	1.386	1.271	1.504
OC9	090	1.365	1.485	1.685	1.578	1.525	1.386	1.358	1.406	1.368	1.242	1.405
OC10	100	1.542	1.592	1.384	1.542	1.381	1.245	1.284	1.292	1.228	1.221	1.280
OC11	110	0.805	0.868	0.997	1.096	1.087	1.092	1.106	0.565	1.072	1.035	1.080
OC12	120	0.595	0.594	0.634	0.715	0.738	0.801	0.815	0.735	0.843	0.835	0.803
OC13	130	0.473	0.447	0.456	0.395	0.395	0.600	0.592	0.543	0.690	0.722	0.603
OC14	140	0.392	0.350	0.315	0.334	0.353	0.435	0.489	0.400	0.607	0.476	0.534
OC15	150	0.197	0.168	0.166	0.154	0.226	0.254	0.255	0.250	0.291	0.377	0.224
OC16	160	-0.095	-0.095	-0.100	-0.076	0.003	0.061	0.043	-0.034	0.090	0.157	0.125
OC17	170	-0.098	-0.077	-0.058	-0.032	-0.045	-0.003	-0.028	-0.053	-0.029	0.125	-0.045

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.593 Rn = 9.4×10^6

CATA TYPE	X/C	14.72C	15.284	15.375	16.175	16.752	17.467	18.18C	18.896	19.153	19.627
ALPHA		1.017	0.991	1.027	1.030	0.977	1.011	1.027	1.105	1.055	1.010
CN		-0.075	-0.060	-0.060	-0.068	-0.081	-0.092	-0.087	-0.073	-0.085	-0.088
CCP 1	-0.10	3.632	3.681	3.725	3.750	3.703	3.724	3.747	3.568	3.714	3.177
DCP 2	-0.20	3.678	3.698	3.416	3.361	3.531	3.555	3.532	3.251	3.457	2.822
DCP 3	-0.30	3.522	2.992	2.944	3.076	3.115	3.100	2.868	2.731	2.841	2.889
DCP 4	-0.49	2.805	2.566	2.385	2.553	2.762	2.827	2.844	2.611	2.535	1.555
DCP 5	-0.74	2.456	2.196	2.347	2.417	2.580	2.704	2.785	2.472	2.455	1.708
DCP 6	-0.99	2.056	1.780	2.217	1.791	1.422	1.392	1.462	2.204	1.825	1.671
DCP 7	-1.49	1.292	1.481	1.815	1.673	1.257	1.340	1.357	1.588	1.592	1.532
DCP 8	-2.00	1.220	1.436	1.443	1.406	1.194	1.224	1.277	1.605	1.254	1.346
DCP 9	-2.50	1.166	1.325	1.377	1.391	1.139	1.164	1.215	1.531	1.307	1.398
DCP10	-3.00	1.130	1.198	1.236	1.237	1.041	1.082	1.145	1.418	1.228	1.374
DCP11	-3.99	1.086	1.133	1.056	1.081	1.021	1.006	1.063	1.131	1.110	1.214
DCP12	-5.01	0.861	0.861	0.919	0.941	0.877	0.888	0.892	0.557	0.584	0.596
DCP13	-6.00	0.657	0.657	0.681	0.801	0.742	0.803	0.855	0.857	0.817	0.821
DCP14	-7.01	0.654	0.653	0.641	0.642	0.720	0.724	0.766	0.665	0.746	0.705
DCP15	-8.00	0.545	0.394	0.441	0.502	0.578	0.621	0.572	0.458	0.590	0.506
DCP16	-9.00	0.286	0.176	0.178	0.155	0.275	0.392	0.284	0.212	0.255	0.191
DCP17	-9.69	0.085	0.032	0.058	-0.033	0.070	0.046	0.075	0.029	0.068	0.023

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.699 Re = 10.0 x 10⁶DATA
TYPE X/C

DATA TYPE	X/C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALPHA																		
CN		-1.641	-0.944	-0.242	0.563	0.823	1.363	1.542	2.641	3.205	3.576	4.741						
CM		-0.102	-0.028	0.061	0.146	0.224	0.312	0.388	0.481	0.578	0.691	0.755						
		-0.026	-0.021	-0.020	-0.015	-0.015	-0.012	-0.011	-0.009	-0.006	-0.006	-0.003						
DCP 1	0.10	-2.395	-2.090	-1.411	-0.670	-0.458	-0.046	0.307	0.605	0.767	1.053	1.390						
DCP 2	0.20	-2.049	-1.472	-0.585	-0.617	-0.264	0.075	0.376	0.637	0.877	1.113	1.301						
DCP 3	0.30	-1.724	-0.627	-0.061	-0.212	-0.009	0.270	0.523	0.744	0.940	1.126	1.286						
DCP 4	0.40	-0.468	-0.440	-0.176	0.123	0.375	0.643	0.890	1.085	1.258	1.423	1.562						
DCP 5	0.50	-0.312	-0.128	0.121	0.385	0.628	0.861	1.038	1.212	1.405	1.555	1.694						
DCP 6	0.60	-0.174	0.010	0.247	0.385	0.664	0.841	1.022	1.212	1.375	1.539	1.680						
DCP 7	0.70	-0.137	0.014	0.185	0.344	0.496	0.632	0.832	1.031	1.247	1.431	1.565						
DCP 8	0.80	-0.133	-0.010	0.135	0.248	0.380	0.490	0.503	0.560	0.658	0.767	0.880						
DCP 9	0.90	-0.055	0.011	0.125	0.244	0.354	0.468	0.493	0.560	0.658	0.767	0.880						
DCP 10	1.00	-0.042	0.045	0.146	0.242	0.345	0.425	0.482	0.560	0.658	0.767	0.880						
DCP 11	1.10	-0.027	0.046	0.129	0.197	0.269	0.354	0.418	0.480	0.560	0.658	0.767						
DCP 12	1.20	-0.007	0.044	0.096	0.154	0.221	0.255	0.322	0.360	0.421	0.476	0.536						
DCP 13	1.30	0.064	0.086	0.125	0.176	0.204	0.237	0.324	0.360	0.421	0.476	0.536						
DCP 14	1.40	0.167	0.192	0.231	0.252	0.274	0.298	0.324	0.351	0.374	0.396	0.418						
DCP 15	1.50	0.062	0.067	0.091	0.104	0.100	0.117	0.135	0.143	0.158	0.163	0.166						
DCP 16	1.60	-0.123	-0.149	-0.139	-0.133	-0.139	-0.144	-0.145	-0.128	-0.128	-0.128	-0.128						
DCP 17	1.70	-0.037	-0.048	-0.064	-0.060	-0.073	-0.068	-0.073	-0.081	-0.082	-0.082	-0.086						

DATA
TYPE X/C

DATA TYPE	X/C	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
ALPHA																		
CN		5.216	5.588	6.337	6.815	7.297	7.586	8.835	9.636	9.810	10.393	11.048						
CM		-0.001	0.001	0.005	-0.015	-0.020	-0.016	-0.024	-0.028	-0.040	-0.047	-0.050						
DCP 1	0.10	1.576	1.804	1.916	2.089	2.206	2.337	2.441	2.557	2.626	2.696	2.765						
DCP 2	0.20	1.467	1.589	1.691	1.829	1.971	2.121	2.260	2.345	2.457	2.571	2.627						
DCP 3	0.30	1.419	1.526	1.627	1.718	1.865	2.016	2.165	2.252	2.354	2.457	2.510						
DCP 4	0.40	1.687	1.767	1.826	1.905	2.064	2.137	2.232	2.296	2.371	2.450	2.494						
DCP 5	0.50	1.801	1.862	1.927	2.010	2.158	2.238	2.322	2.390	2.415	2.477	2.484						
DCP 6	0.60	1.923	1.946	2.044	2.107	2.158	2.238	2.292	2.340	2.335	2.323	2.306						
DCP 7	0.70	1.906	1.980	2.034	2.098	2.130	2.184	2.252	2.264	2.264	2.264	2.264						
DCP 8	0.80	1.830	1.904	1.927	2.016	2.130	2.184	2.252	2.264	2.264	2.264	2.264						
DCP 9	0.90	1.825	1.877	1.927	2.016	2.130	2.184	2.252	2.264	2.264	2.264	2.264						
DCP 10	1.00	1.744	1.802	1.836	1.928	2.041	2.134	2.186	2.252	2.264	2.264	2.264						
DCP 11	1.10	0.918	0.990	1.055	1.134	1.228	1.312	1.386	1.441	1.486	1.545	1.584						
DCP 12	1.20	0.455	0.658	0.704	0.734	0.753	0.723	0.732	0.756	0.777	0.766	0.752						
DCP 13	1.30	0.280	0.368	0.432	0.475	0.508	0.559	0.617	0.605	0.655	0.667	0.684						
DCP 14	1.40	0.292	0.230	0.303	0.367	0.363	0.381	0.476	0.520	0.537	0.536	0.573						
DCP 15	1.50	0.130	0.081	0.102	0.183	0.196	0.215	0.274	0.252	0.372	0.430	0.527						
DCP 16	1.60	-0.120	-0.154	-0.121	-0.057	-0.025	-0.095	-0.035	-0.016	0.081	0.170	0.277						
DCP 17	1.70	-0.035	-0.117	-0.092	-0.085	-0.030	-0.026	-0.076	-0.053	0.020	0.102	0.234						

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE	X/C	M = 0.699	Rn = 10.0 x 10 ⁶	FLOOR AND CEILING WITH 4.9% POROSITY	
ALPHA		11.565	12.218	13.023	14.572
CN		0.956	0.940	0.940	1.031
CM		-0.054	-0.050	-0.049	-0.063
DCP 1	0.10	2.860	2.872	2.895	3.143
DCP 2	0.20	2.720	2.776	2.862	3.052
DCP 3	0.30	2.594	2.648	2.746	2.920
DCP 4	0.40	2.566	2.607	2.692	2.839
DCP 5	0.50	2.570	2.613	2.691	2.723
DCP 6	0.60	2.536	2.536	2.572	2.576
DCP 7	0.70	2.054	2.025	2.057	2.256
DCP 8	0.80	1.081	1.060	1.027	1.393
DCP 9	0.90	1.045	1.002	1.010	1.108
DCP 10	1.00	1.011	0.950	0.946	1.087
DCP 11	1.10	0.601	0.913	0.947	0.928
DCP 12	1.20	0.755	0.744	0.765	0.861
DCP 13	1.30	0.725	0.577	0.611	0.695
DCP 14	1.40	0.600	0.590	0.621	0.554
DCP 15	1.50	0.454	0.497	0.535	0.471
DCP 16	1.60	0.196	0.216	0.271	0.270
DCP 17	1.70	0.030	-0.0035	-0.000	-0.058
15.189					
1.047					
-0.065					
3.183					
3.112					
2.576					
2.851					
2.722					
2.454					
2.314					
1.135					
1.100					
1.064					
0.997					
0.877					
0.754					
0.698					
0.534					
0.261					
-0.005					
15.712					
1.385					
-0.072					
3.210					
3.158					
3.032					
2.866					
2.763					
2.543					
2.369					
1.206					
1.160					
1.087					
1.115					
1.002					
0.887					
0.813					
0.770					
0.582					
0.270					
-0.057					
16.534					
1.127					
-0.082					
3.247					
3.217					
3.032					
2.852					
2.733					
2.513					
2.422					
1.481					
1.367					
1.115					
1.152					
0.941					
0.860					
0.784					
0.640					
0.374					
-0.014					
17.736					
1.185					
-0.110					
3.294					
3.217					
2.996					
2.667					
2.594					
2.465					
2.422					
1.481					
1.367					
1.115					
1.152					
0.941					
0.860					
0.784					
0.640					
0.374					
-0.014					

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

DATA TYPE	X/C	18.183	19.625	19.245
ALPHA		1.198	1.213	1.217
CN		-0.093	-0.122	-0.134
DCP 1	0.10	3.316	3.301	3.089
DCP 2	0.20	3.005	2.916	2.971
DCP 3	0.30	2.675	2.857	2.832
DCP 4	0.40	2.335	2.315	2.011
DCP 5	0.50	2.064	1.868	1.943
DCP 6	0.60	2.157	1.462	1.888
DCP 7	0.70	2.312	2.152	1.959
DCP 8	0.80	1.551	1.865	1.841
DCP 9	0.90	1.757	1.601	1.752
DCP 10	1.00	1.573	1.525	1.522
DCP 11	1.10	1.466	1.304	1.357
DCP 12	1.20	1.171	1.075	1.148
DCP 13	1.30	0.922	0.928	1.020
DCP 14	1.40	0.762	0.540	0.928
DCP 15	1.50	0.612	0.762	0.604
DCP 16	1.60	0.203	0.360	0.394
DCP 17	1.70	-0.122	0.027	0.023

N = 0.702 Rn = 10.0 x 10 ⁶											
FLOOR AND CEILING WITH 4.9% POROSITY											
ALPHA	-0.298	0.696	1.93C	3.028	3.995	5.032	5.895	6.751	7.912	6.031	9.054
CM	0.139	0.272	0.434	0.575	0.720	0.817	0.840	0.534	0.917	0.941	0.944
CM	-0.018	-0.015	-0.009	-0.006	-0.004	-0.001	-0.005	-0.026	-0.009	-0.017	-0.025
DCP 1	-0.100	-0.225	0.346	0.727	1.226	1.494	1.748	2.125	2.147	2.437	4.573
DCP 2	-0.020	-0.079	0.452	0.848	1.164	1.446	1.633	1.875	2.055	2.272	2.421
DCP 3	-0.030	0.139	0.605	0.945	1.201	1.426	1.573	1.766	1.948	2.173	2.311
DCP 4	-0.044	0.042	0.903	1.242	1.473	1.664	1.782	1.919	2.011	2.191	2.317
DCP 5	-0.074	0.077	1.191	1.486	1.663	1.845	1.946	2.066	2.134	2.281	2.370
DCP 6	-0.099	0.074	1.288	1.534	1.720	1.901	1.956	2.117	2.163	2.289	2.342
DCP 7	-0.149	0.328	1.306	1.542	1.721	1.882	1.945	2.102	2.132	2.241	2.248
DCP 8	-0.200	0.243	1.061	1.465	1.662	1.825	1.907	2.026	2.068	2.172	1.625
DCP 9	-0.250	0.235	0.474	1.450	1.632	1.783	1.792	1.927	1.894	2.004	1.273
DCP10	-0.300	0.216	0.475	0.664	1.562	1.715	1.300	1.318	1.255	1.355	1.172
DCP11	-0.395	0.190	0.434	0.410	0.713	0.967	0.925	0.967	1.000	1.030	1.060
DCP12	-0.501	0.156	0.330	0.364	0.321	0.635	0.691	0.778	0.742	0.843	0.816
DCP13	-0.600	0.170	0.292	0.336	0.307	0.288	0.340	0.576	0.555	0.587	0.622
DCP14	-0.701	0.258	0.340	0.370	0.347	0.246	0.281	0.414	0.347	0.417	0.442
DCP15	-0.800	0.094	0.116	0.145	0.162	0.114	0.133	0.205	0.122	0.175	0.270
DCP16	-0.900	-0.137	-0.139	-0.121	-0.115	-0.135	-0.064	-0.014	-0.099	-0.061	-0.023
DCP17	-0.969	-0.057	-0.083	-0.074	-0.084	-0.103	-0.102	-0.067	-0.084	-0.040	-0.080
ALPHA	9.708	9.685	1.621	10.948	10.928	10.866	10.967	11.688	11.854	12.073	12.029
CM	0.985	0.902	0.905	0.917	0.932	0.943	0.924	0.936	0.937	0.953	0.945
CM	-0.027	-0.031	-0.046	-0.047	-0.053	-0.049	-0.043	-0.051	-0.046	-0.047	-0.052
DCP 1	2.591	2.597	2.672	2.601	2.595	2.601	2.772	2.729	2.807	2.841	2.825
DCP 2	2.470	2.445	2.504	2.566	2.567	2.593	2.814	2.707	2.714	2.714	2.714
DCP 3	2.354	2.331	2.399	2.459	2.455	2.478	2.502	2.586	2.583	2.601	2.602
DCP 4	2.155	2.130	2.382	2.441	2.440	2.457	2.480	2.561	2.554	2.554	2.571
DCP 5	2.024	2.004	2.451	2.501	2.489	2.519	2.525	2.614	2.603	2.618	2.618
DCP 6	2.413	2.393	2.432	2.467	2.458	2.493	2.482	2.493	2.512	2.511	2.497
DCP 7	2.344	2.148	2.027	2.026	2.042	2.074	2.052	2.045	2.096	2.101	2.044
DCP 8	2.836	1.197	1.035	1.060	1.094	1.143	1.069	1.057	1.107	1.107	1.153
DCP 9	1.308	1.131	1.012	1.037	1.036	1.055	1.024	0.984	1.035	1.057	1.020
DCP10	1.225	1.009	0.965	0.964	0.967	1.051	0.976	0.911	0.962	1.009	0.962
DCP11	1.115	0.965	0.903	0.856	0.870	0.923	0.872	0.848	0.910	0.907	0.879
DCP12	0.816	0.703	0.611	0.731	0.760	0.758	0.621	0.700	0.777	0.606	0.766
DCP13	0.600	0.586	0.622	0.635	0.660	0.670	0.674	0.625	0.653	0.678	0.646
DCP14	0.451	0.498	0.550	0.556	0.678	0.604	0.574	0.602	0.550	0.643	0.643
DCP15	0.246	0.280	0.365	0.425	0.415	0.395	0.400	0.475	0.451	0.400	0.435
DCP16	0.020	0.040	0.173	0.136	0.165	0.161	0.117	0.165	0.159	0.171	0.215
DCP17	-0.066	0.005	0.000	-0.001	-0.011	-0.009	-0.036	0.026	-0.024	-0.041	-0.003

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.702 Re = 10.0 x 10⁶

ALPHA CN CM	12.353 0.960 -0.052	12.803 0.978 -0.056	12.960 0.976 -0.057	12.849 0.976 -0.052	13.297 0.997 -0.058	13.831 1.015 -0.063	13.940 1.011 -0.057	13.761 1.010 -0.057	13.964 1.015 -0.060	14.560 1.045 -0.065	15.022 1.057 -0.067
DCP 1	0.010	2.828	2.805	2.861	2.968	2.862	2.998	2.956	3.011	3.112	3.138
DCP 2	0.020	2.858	2.830	2.847	2.879	2.960	2.955	2.932	2.963	3.059	3.071
DCP 3	0.030	2.681	2.692	2.718	2.755	2.843	2.833	2.811	2.844	2.934	2.951
DCP 4	0.049	2.649	2.696	2.670	2.710	2.765	2.735	2.735	2.771	2.755	2.787
DCP 5	0.074	2.677	2.698	2.691	2.704	2.725	2.748	2.699	2.729	2.685	2.749
DCP 6	0.099	2.535	2.540	2.520	2.556	2.548	2.568	2.542	2.565	2.451	2.491
DCP 7	0.149	2.081	2.109	2.154	2.131	2.199	2.204	2.223	2.238	2.297	2.335
DCP 8	0.200	1.052	1.043	1.125	1.048	1.113	1.141	1.211	1.166	1.212	1.201
DCP 9	0.250	1.028	1.027	1.107	1.051	1.055	1.073	1.096	1.078	1.126	1.133
DCP 10	0.300	0.973	0.958	0.970	1.068	1.076	1.011	0.956	0.977	1.008	1.021
DCP 11	0.399	0.840	0.842	0.918	0.941	0.935	0.915	0.943	0.936	0.871	0.911
DCP 12	0.501	0.669	0.677	0.757	0.823	0.805	0.829	0.829	0.786	0.742	0.763
DCP 13	0.600	0.632	0.677	0.625	0.668	0.697	0.751	0.733	0.700	0.663	0.686
DCP 14	0.701	0.481	0.536	0.488	0.491	0.584	0.513	0.547	0.532	0.534	0.631
DCP 15	0.800	0.216	0.245	0.211	0.227	0.253	0.195	0.232	0.241	0.246	0.234
DCP 16	0.900	0.030	0.073	0.050	0.012	0.007	0.064	0.091	0.018	0.035	0.054
DCP 17	0.964	-0.026	-0.073	-0.050	-0.012	0.007	-0.064	-0.091	-0.018	0.035	-0.054
ALPHA CN CM	15.071 1.054 -0.067	14.716 1.755 -0.069	15.123 1.075 -0.069	15.771 1.367 -0.072	15.694 1.109 -0.083	15.871 1.102 -0.077	16.370 1.122 -0.060	16.575 1.117 -0.092	16.706 1.129 -0.089	16.620 1.090 -0.094	16.763 1.119 -0.098
DCP 1	0.010	3.076	3.160	3.244	3.173	3.174	3.240	3.261	3.265	3.245	3.258
DCP 2	0.020	3.056	3.120	3.183	3.142	3.128	3.180	3.222	3.224	3.138	2.931
DCP 3	0.030	2.937	2.992	3.043	3.011	3.012	3.045	3.014	3.049	2.928	1.598
DCP 4	0.049	2.767	2.810	2.831	2.814	2.801	2.841	2.884	2.832	2.711	2.344
DCP 5	0.074	2.685	2.744	2.711	2.656	2.751	2.723	2.295	2.721	1.952	2.315
DCP 6	0.099	2.462	2.517	2.508	2.501	2.526	2.529	2.177	2.548	1.827	2.251
DCP 7	0.149	2.339	2.346	2.435	2.418	2.422	2.451	2.060	2.106	1.722	2.075
DCP 8	0.200	1.163	1.240	1.171	1.250	1.249	1.300	1.406	1.365	1.464	1.769
DCP 9	0.250	1.153	1.139	1.144	1.224	1.192	1.223	1.251	1.251	1.548	1.345
DCP 10	0.300	1.081	1.087	1.103	1.114	1.136	1.131	1.315	1.174	1.453	1.257
DCP 11	0.349	0.995	1.068	0.949	1.076	1.093	1.120	1.152	1.101	1.241	1.138
DCP 12	0.501	0.702	0.891	0.916	0.698	0.892	0.913	0.959	0.959	1.052	1.021
DCP 13	0.600	0.754	0.801	0.842	0.757	0.849	0.835	0.849	0.840	0.962	0.900
DCP 14	0.701	0.790	0.710	0.769	0.615	0.717	0.775	0.797	0.807	0.777	0.824
DCP 15	0.800	0.572	0.585	0.577	0.635	0.650	0.619	0.635	0.684	0.591	0.683
DCP 16	0.900	0.258	0.256	0.250	0.330	0.346	0.325	0.275	0.334	0.213	0.307
DCP 17	0.964	-0.022	-0.036	-0.050	0.043	-0.016	-0.028	-0.002	0.010	-0.121	-0.088

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.702 Re = 10.0 x 10⁶

ALPHA	17.428	17.930	17.123	17.631	18.113	16.566	16.714	18.925	18.834	15.393	19.427
CN	1.126	1.114	1.156	1.136	1.124	1.163	1.180	1.164	1.158	1.140	1.219
CM	-0.114	-0.111	-0.112	-0.114	-0.119	-0.132	-0.137	-0.131	-0.128	-0.138	-0.148
DCP 1	-0.10	3.126	3.325	3.294	3.274	3.284	3.316	3.321	3.284	3.043	3.069
DCP 2	-0.20	3.099	3.017	2.973	2.998	2.948	3.156	3.144	3.036	2.859	2.998
DCP 3	-0.30	3.035	2.692	1.981	2.025	2.843	2.767	2.843	2.666	2.429	2.657
DCP 4	-0.49	1.832	1.843	2.385	2.179	1.804	1.803	1.819	1.847	1.836	1.863
DCP 5	-0.74	1.830	1.781	2.320	2.136	1.741	1.726	1.755	1.754	1.742	1.776
DCP 6	-0.99	1.730	1.711	2.249	2.052	1.634	1.651	1.677	1.676	1.676	1.708
DCP 7	-1.49	1.662	1.585	2.028	1.966	1.563	1.544	1.522	1.557	1.557	1.593
DCP 8	-2.00	1.597	1.498	1.826	1.805	1.375	1.411	1.427	1.461	1.495	1.516
DCP 9	-2.50	1.665	1.723	1.364	1.387	1.652	1.597	1.526	1.653	1.792	1.782
DCP10	-3.00	1.452	1.666	1.284	1.305	1.658	1.755	1.735	1.665	1.721	1.747
DCP11	-3.99	1.257	1.456	1.197	1.216	1.438	1.530	1.480	1.468	1.485	1.476
DCP12	-5.01	1.078	1.036	1.061	1.054	1.216	1.207	1.198	1.186	1.229	1.258
DCP13	-6.00	0.978	0.869	0.934	0.929	1.021	1.024	1.001	0.903	1.006	1.091
DCP14	-7.01	0.869	0.816	0.854	0.844	0.895	0.873	0.864	0.855	0.846	0.914
DCP15	-8.00	0.679	0.669	0.740	0.716	0.712	0.727	0.721	0.754	0.748	0.793
DCP16	-9.00	0.295	0.270	0.368	0.374	0.323	0.350	0.345	0.336	0.343	0.366
DCP17	-9.69	-0.052	-0.027	0.316	0.301	0.013	0.079	0.018	0.006	0.094	0.130

ALPHA	19.533	19.538	19.644	19.732	19.542
CN	1.246	1.210	1.206	1.217	1.207
CM	-0.157	-0.144	-0.143	-0.145	-0.143
DCP 1	-0.10	3.195	3.062	3.063	2.921
DCP 2	-0.20	3.077	2.963	2.867	2.837
DCP 3	-0.30	2.650	2.862	2.736	2.610
DCP 4	-0.49	1.871	1.855	1.850	1.874
DCP 5	-0.74	1.776	1.753	1.778	1.782
DCP 6	-0.99	1.706	1.705	1.700	1.714
DCP 7	-1.49	1.624	1.607	1.557	1.602
DCP 8	-2.00	1.465	1.464	1.514	1.519
DCP 9	-2.50	1.675	1.761	1.792	1.826
DCP10	-3.00	1.775	1.763	1.735	1.863
DCP11	-3.99	1.543	1.518	1.491	1.478
DCP12	-5.01	1.303	1.216	1.204	1.218
DCP13	-6.00	1.122	1.019	1.056	1.035
DCP14	-7.01	0.977	0.875	0.921	0.899
DCP15	-8.00	0.501	0.798	0.750	0.757
DCP16	-9.00	0.415	0.401	0.394	0.403
DCP17	-9.69	0.150	0.103	0.062	0.104

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.750 Re = 10.6 x 10⁶

FLOOR AND CEILING WITH 4.9% POROSITY

ALPHA CN CM	2.145 3.404 -0.013	1.478 0.316 -0.014	0.674 0.218 -0.015	-0.003 0.110 -0.021	-0.623 0.016 -0.024	-1.306 -0.076 -0.025	-1.854 -0.182 -0.034	-2.288 -0.334 -0.037	-2.785 -0.433 -0.042	-3.544 -0.505 -0.047	-4.215 -0.608 -0.037
DCP 1	0.010	0.361	0.716	-0.149	-1.742	-1.583	-2.155	-2.344	-2.554	-2.635	-2.712
DCP 2	0.020	0.237	0.552	-0.327	-1.372	-1.715	-1.546	-2.127	-2.336	-2.448	-2.552
DCP 3	0.030	0.111	0.426	-0.564	-1.041	-1.453	-1.285	-1.887	-2.054	-2.198	-2.314
DCP 4	0.040	0.147	0.168	-0.074	-0.321	-0.595	-1.285	-1.493	-1.636	-1.825	-1.952
DCP 5	0.049	0.177	0.075	0.196	-0.066	0.510	-0.855	-1.184	-1.372	-1.573	-1.752
DCP 6	0.099	0.813	0.635	0.418	0.144	0.010	-0.734	-1.005	-1.198	-1.354	-1.497
DCP 7	0.149	0.875	0.895	0.315	0.392	-0.045	-0.581	-0.815	-1.044	-1.248	-1.382
DCP 8	0.200	0.826	0.585	0.187	0.176	-0.358	-0.381	-0.598	-1.089	-1.207	-1.327
DCP 9	0.250	0.582	0.262	0.217	0.103	-0.095	-0.054	-0.536	-1.054	-1.184	-1.302
DCP 10	0.300	0.561	0.303	0.225	0.103	-0.305	-0.054	-0.604	-0.525	-1.071	-1.183
DCP 11	0.395	0.250	0.275	0.175	0.045	0.326	-0.363	-0.032	-0.026	-0.402	-0.782
DCP 12	0.501	0.147	0.213	0.150	0.094	0.016	-0.046	-0.365	-0.026	-0.384	-0.252
DCP 13	0.600	0.234	0.234	0.167	0.134	0.086	0.035	-0.005	0.032	0.052	0.015
DCP 14	0.701	0.734	0.311	0.265	0.224	0.164	0.198	0.164	0.167	0.171	0.184
DCP 15	0.800	0.105	0.107	0.075	0.090	0.078	0.055	0.027	0.035	0.036	0.067
DCP 16	0.900	-0.152	-0.161	-0.152	-0.161	-0.153	-0.143	-0.142	-0.153	-0.136	-0.095
DCP 17	0.969	-0.080	-0.061	-0.063	-0.067	-0.044	-0.036	-0.053	-0.057	-0.035	-0.031
ALPHA CN CM	-1.783 -0.123 -0.032	-1.174 -0.033 -0.028	-0.748 0.062 -0.022	-0.149 0.155 -0.019	0.377 0.256 -0.019	1.073 0.368 -0.015	1.619 0.464 -0.013	6.485 0.758 -0.026	7.171 0.786 -0.030	7.868 0.805 -0.036	8.634 0.796 -0.038
DCP 1	-0.010	-1.864	-1.500	-0.927	-0.520	-0.179	0.104	1.513	1.626	1.796	1.900
DCP 2	-0.020	-1.575	-1.079	-0.721	-0.369	-0.075	0.183	1.353	1.418	1.579	1.671
DCP 3	-0.030	-1.290	-0.753	-0.411	-0.115	0.136	0.347	1.316	1.378	1.501	1.602
DCP 4	-0.049	-0.581	-0.216	0.041	0.286	0.511	0.706	1.524	1.565	1.664	1.719
DCP 5	-0.074	-0.311	0.022	0.273	0.490	0.689	0.855	1.649	1.685	1.781	1.819
DCP 6	-0.099	-0.078	0.271	0.527	0.713	0.884	1.027	1.737	1.762	1.861	1.896
DCP 7	-0.149	-0.053	0.190	0.510	0.805	0.966	1.101	1.721	1.760	1.848	1.880
DCP 8	-0.200	-0.036	0.119	0.220	0.755	0.911	1.078	1.671	1.704	1.887	1.915
DCP 9	-0.250	0.006	0.145	0.263	0.307	0.518	1.056	1.496	1.533	1.647	1.677
DCP 10	-0.300	0.046	0.161	0.268	0.294	0.37	1.010	1.108	1.107	1.000	0.947
DCP 11	-0.399	0.025	0.154	0.229	0.308	0.274	0.717	0.757	0.776	0.833	0.745
DCP 12	-0.501	0.006	0.108	0.180	0.236	0.232	0.200	0.607	0.644	0.710	0.594
DCP 13	-0.600	0.021	0.142	0.182	0.245	0.260	0.215	0.473	0.548	0.579	0.576
DCP 14	-0.701	0.224	0.254	0.293	0.307	0.327	0.325	0.389	0.426	0.466	0.535
DCP 15	-0.800	0.067	0.067	0.084	0.112	0.095	0.115	0.288	0.288	0.291	0.363
DCP 16	-0.900	-0.142	-0.147	-0.161	-0.143	-0.133	-0.134	-0.051	-0.066	0.003	0.059
DCP 17	-0.969	-0.043	-0.035	-0.077	-0.068	-0.075	-0.072	-0.110	-0.092	-0.105	-0.149

AIRFOIL NLR 7233-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

$$M = 0.750 \quad R_n = 10.0 \times 10^6$$

ALPHA CN	9.054 0.913 -0.045	9.431 0.868 -0.048	10.087 0.902 -0.051	10.703 0.892 -0.051	11.247 0.875 -0.054	11.861 0.921 -0.067	12.512 0.954 -0.072	13.217 0.995 -0.078	13.904 1.054 -0.092	14.267 1.075 -0.095
DCP 1	-0.010	2.054	2.293	2.347	2.462	2.507	2.589	2.643	2.703	2.765
DCP 2	-0.020	1.819	2.082	2.158	2.269	2.327	2.433	2.495	2.556	2.626
DCP 3	-0.030	1.750	1.996	2.068	2.179	2.223	2.321	2.382	2.456	2.518
DCP 4	-0.049	1.315	2.018	2.073	2.171	2.208	2.297	2.349	2.420	2.477
DCP 5	-0.074	1.890	2.057	2.110	2.196	2.237	2.325	2.371	2.424	2.484
DCP 6	-0.099	1.932	2.096	2.142	2.213	2.247	2.329	2.373	2.426	2.483
DCP 7	-0.149	1.926	2.048	2.080	2.044	2.052	2.117	2.122	2.175	2.212
DCP 8	-0.200	1.878	1.657	1.484	1.046	1.118	1.120	1.200	1.223	1.256
DCP 9	-0.250	1.816	1.119	1.050	0.774	0.987	1.094	1.059	1.189	1.196
DCP10	-0.300	1.278	0.991	0.974	0.873	0.989	0.974	1.052	1.092	1.130
DCP11	-0.399	0.858	0.899	0.821	0.815	0.832	0.864	0.953	1.043	1.045
DCP12	-0.501	0.684	0.747	0.782	0.756	0.778	0.749	0.845	0.905	0.926
DCP13	-0.600	0.593	0.609	0.623	0.603	0.686	0.709	0.721	0.794	0.825
DCP14	-0.701	0.561	0.572	0.600	0.589	0.632	0.667	0.700	0.759	0.735
DCP15	-0.800	0.447	0.468	0.469	0.506	0.544	0.607	0.617	0.655	0.688
DCP16	-0.900	0.055	0.152	0.177	0.221	0.288	0.307	0.370	0.354	0.402
DCP17	-0.949	-0.180	-0.203	-0.179	-0.149	-0.068	-0.046	-0.044	0.045	0.048

$$M = 0.797 \quad Rn = 10.5 \times 10^6$$

	ALPHA	-1.687	-1.062	-0.507	-0.045	0.614	1.098	1.721	2.341	3.143	3.836	4.234
CCN	-0.131	-0.221	-0.105	-0.221	-0.332	0.332	0.416	0.455	0.479	0.478	0.505	0.495
CM	-0.035	-0.028	-0.029	-0.028	-0.035	-0.035	-0.040	-0.039	-0.031	-0.018	-0.015	0.001
OCP 1	-0.010	-1.668	-1.423	-0.981	-0.675	0.428	0.428	-0.258	-0.064	0.097	0.278	0.420
OCP 2	-0.020	-1.592	-1.400	-0.813	-0.543	-0.312	-0.312	-0.163	0.022	0.160	0.313	0.433
OCP 3	-0.030	-1.366	-1.165	-0.512	-0.282	-0.095	-0.095	0.035	0.186	0.309	0.443	0.539
OCP 4	-0.049	-0.969	-0.711	-0.183	0.123	0.286	0.286	0.394	0.524	0.619	0.739	0.830
OCP 5	-0.074	-0.479	-0.352	-0.137	0.137	0.312	0.459	0.554	0.668	0.756	0.877	0.963
OCP 6	-0.099	-0.346	-0.113	0.234	0.419	0.562	0.676	0.747	0.843	0.923	1.018	1.097
OCP 7	-0.149	-0.333	0.080	0.335	0.517	0.654	0.761	0.831	0.922	0.982	1.067	1.127
OCP 8	-0.200	-0.393	0.016	0.314	0.505	0.618	0.734	0.802	0.896	0.955	1.033	1.089
OCP 9	-0.250	-0.398	0.029	0.283	0.519	0.638	0.735	0.802	0.887	0.942	1.027	1.078
DCP10	-0.300	-0.333	0.078	0.189	0.513	0.628	0.730	0.795	0.869	0.917	0.987	1.046
DCP11	-0.399	-0.124	0.074	0.162	0.497	0.637	0.728	0.850	0.895	0.917	0.950	0.993
DCP12	-0.501	0.091	0.092	0.217	0.237	0.624	0.712	0.749	0.807	0.844	0.861	0.877
DCP13	-0.600	0.131	0.166	0.202	0.152	0.416	0.763	0.802	0.563	0.215	0.201	0.204
DCP14	-0.701	0.270	0.299	0.326	0.324	0.184	0.148	0.179	0.148	0.145	0.169	0.181
DCP15	-0.800	0.056	0.061	0.066	0.072	0.045	-0.001	-0.019	-0.001	0.032	0.078	0.104
DCP16	-0.900	-0.159	-0.151	-0.168	-0.159	-0.169	-0.196	-0.208	-0.185	-0.031	-0.201	-0.196
DCP17	-0.969	-0.059	-0.047	-0.057	-0.056	-0.071	-0.086	-0.118	-0.113	-0.120	-0.114	-0.104

ALPHA	4.728	5.358	5.907	6.476	7.285	7.851	8.514	8.992	9.601	10.150	10.777
CM	0.530	0.576	0.628	0.679	0.735	0.801	0.865	0.951	1.026	1.099	1.197
CM	0.001	-0.006	-0.016	-0.025	-0.041	-0.053	-0.069	-0.093	-0.110	-0.130	-0.161
DCP 1	-0.574	0.728	0.846	1.045	1.074	1.257	1.387	1.530	1.654	1.781	1.880
DCP 2	-0.571	0.709	0.810	0.950	1.039	1.159	1.248	1.331	1.454	1.573	1.683
DCP 3	-0.530	0.765	0.838	0.963	1.038	1.131	1.248	1.291	1.390	1.509	1.612
DCP 4	-0.649	0.924	1.086	1.186	1.242	1.322	1.388	1.448	1.523	1.588	1.668
DCP 5	-0.74	1.143	1.208	1.300	1.343	1.438	1.496	1.545	1.610	1.667	1.730
DCP 6	-0.899	1.168	1.262	1.405	1.442	1.518	1.581	1.625	1.691	1.736	1.783
DCP 7	-1.409	1.202	1.322	1.408	1.440	1.515	1.565	1.611	1.670	1.720	1.761
DCP 8	-1.148	1.219	1.271	1.347	1.390	1.459	1.513	1.553	1.610	1.655	1.701
DCP 9	-1.138	1.205	1.241	1.322	1.359	1.427	1.471	1.513	1.566	1.611	1.651
DCP10	-0.900	1.160	1.194	1.261	1.303	1.358	1.406	1.444	1.492	1.540	1.571
DCP11	-0.566	1.013	1.081	1.059	1.154	1.247	1.332	1.387	1.434	1.478	1.518
DCP12	-0.348	0.395	0.448	0.497	0.548	0.606	0.698	0.966	1.240	1.368	1.408
DCP13	-0.221	0.273	0.324	0.373	0.433	0.506	0.554	0.628	0.694	0.818	1.305
DCP14	-0.701	0.239	0.296	0.336	0.390	0.441	0.515	0.582	0.641	0.716	0.792
DCP15	-0.800	0.135	0.243	0.268	0.319	0.392	0.440	0.532	0.582	0.651	0.720
DCP16	-0.145	-0.125	-0.063	-0.027	0.053	0.090	0.157	0.243	0.288	0.332	0.425
DCP17	-0.475	-0.433	-0.393	-0.335	-0.272	-0.241	-0.163	-0.083	-0.031	0.050	0.117

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.797 Re = 10.5×10^6 FLOOR AND CEILING WITH 4.9% POROSITY

ALPHA	11.200	12.076	12.639	13.317	13.783
CN	1.280	1.437	1.524	1.563	1.608
CM	-0.186	-0.258	-0.293	-0.300	-0.308
DCP 1	.010	2.070	2.127	2.237	2.291
DCP 2	.020	1.888	1.985	2.062	2.156
DCP 3	.030	1.727	1.906	1.984	2.072
DCP 4	.049	1.754	1.893	1.963	2.042
DCP 5	.074	1.803	1.932	1.990	2.060
DCP 6	.099	1.845	1.959	2.013	2.078
DCP 7	.149	1.811	1.909	1.958	2.018
DCP 8	.200	1.760	1.848	1.894	1.948
DCP 9	.250	1.705	1.795	1.837	1.890
DCP10	.300	1.624	1.706	1.745	1.792
DCP11	.399	1.566	1.648	1.685	1.731
DCP12	.501	1.454	1.533	1.566	1.615
DCP13	.600	1.398	1.470	1.503	1.543
DCP14	.701	1.026	1.444	1.473	1.506
DCP15	.800	0.786	1.495	1.516	1.533
DCP16	.900	0.510	1.218	1.251	1.275
DCP17	.969	0.209	0.456	0.517	0.543

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.800 Rn = 10.5 x 10⁶

	ALPHA	1.626	1.052	0.557	-0.253	-0.983	-1.486	-2.193	-2.558	-4.695	-5.139	-5.930
CN		0.425	0.365	0.260	0.158	0.028	-0.079	-0.231	-0.346	-0.523	-0.550	-0.537
CM		-0.039	-0.038	-0.027	-0.028	-0.030	-0.034	-0.031	-0.026	-0.003	-0.012	-0.030
DCP 1	-0.010	-0.425	-0.637	-0.900	-1.293	-1.609	-1.775	-1.956	-2.065	-2.239	-2.377	-2.425
DCP 2	-0.020	-0.252	-0.450	-0.687	-0.938	-1.271	-1.510	-1.680	-1.838	-2.049	-2.185	-2.238
DCP 3	-0.030	-0.050	-0.216	-0.416	-0.760	-1.019	-1.287	-1.470	-1.624	-1.837	-1.989	-2.049
DCP 4	-0.049	0.323	0.176	0.024	-0.156	-0.503	-0.868	-1.073	-1.235	-1.471	-1.625	-1.687
DCP 5	-0.074	0.485	0.354	0.204	-0.049	-0.264	-0.417	-0.573	-0.728	-1.131	-1.311	-1.392
DCP 6	-0.099	0.697	0.592	0.475	0.308	0.014	-0.251	-0.484	-0.726	-1.013	-1.177	-1.246
DCP 7	-0.149	0.781	0.687	0.568	0.414	0.212	-0.249	-0.476	-0.685	-0.927	-1.082	-1.148
DCP 8	-0.200	0.750	0.647	0.547	0.394	0.069	-0.316	-0.546	-0.714	-0.912	-1.050	-1.101
DCP 9	-0.250	0.756	0.667	0.561	0.414	0.049	-0.256	-0.538	-0.696	-0.882	-1.007	-1.058
DCP10	-0.300	0.744	0.656	0.545	0.414	0.146	0.103	-0.466	-0.612	-0.792	-0.913	-0.962
DCP11	-0.399	0.736	0.642	0.545	0.380	0.108	0.072	-0.474	-0.615	-0.778	-0.894	-0.890
DCP12	-0.501	0.711	0.649	0.553	0.116	0.144	0.067	0.127	-0.350	-0.756	-0.307	-0.272
DCP13	-0.600	0.765	0.704	0.625	0.208	0.178	0.118	0.140	0.156	-0.111	-0.123	-0.133
DCP14	-0.701	0.196	0.137	0.227	0.325	0.311	0.283	0.276	0.296	0.123	0.094	0.045
DCP15	-0.800	-0.024	0.005	0.050	0.065	0.061	0.064	0.067	0.088	0.054	-0.016	0.362
DCP16	-0.900	-0.215	-0.204	-0.184	-0.168	-0.173	-0.160	-0.171	-0.141	-0.091	-0.104	-0.158
DCP17	-0.969	-0.093	-0.087	-0.081	-0.067	-0.059	-0.041	-0.057	-0.061	-0.079	-0.059	-0.056

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

	ALPHA	-6.497	-7.072	-7.508	-8.021	-8.819	-9.433	-10.113
CN		-0.535	-0.561	-0.559	-0.602	-0.666	-0.738	-0.807
CM		-0.037	-0.036	-0.057	-0.053	-0.041	-0.025	-0.004
DCP 1	-0.010	-2.503	-2.573	-2.618	-2.643	-2.837	-2.781	-2.768
DCP 2	-0.020	-2.303	-2.369	-2.427	-2.486	-2.532	-2.593	-2.615
DCP 3	-0.030	-2.122	-2.178	-2.243	-2.308	-2.367	-2.437	-2.464
DCP 4	-0.049	-1.760	-1.836	-1.711	-1.979	-2.046	-2.113	-2.151
DCP 5	-0.074	-1.471	-1.549	-1.639	-1.707	-1.783	-1.858	-1.901
DCP 6	-0.099	-1.328	-1.400	-1.475	-1.543	-1.611	-1.686	-1.734
DCP 7	-0.149	-1.231	-1.304	-1.382	-1.445	-1.506	-1.570	-1.608
DCP 8	-0.200	-1.144	-1.227	-1.295	-1.365	-1.427	-1.489	-1.524
DCP 9	-0.250	-1.119	-1.183	-1.247	-1.299	-1.361	-1.415	-1.447
DCP10	-0.300	-1.015	-1.071	-1.084	-1.132	-1.213	-1.281	-1.327
DCP11	-0.399	-0.637	-0.557	-0.534	-0.582	-0.701	-0.852	-1.036
DCP12	-0.501	-0.303	-0.321	-0.381	-0.445	-0.506	-0.590	-0.648
DCP13	-0.600	-0.136	-0.173	-0.238	-0.286	-0.361	-0.433	-0.487
DCP14	-0.701	0.054	-0.017	-0.045	-0.106	-0.152	-0.212	-0.278
DCP15	-0.800	0.420	0.386	0.358	0.270	0.238	0.173	0.098
DCP16	-0.900	-0.157	-0.093	0.339	0.301	0.265	0.209	0.123
DCP17	-0.969	-0.087	-0.102	-0.064	0.162	0.100	0.045	-0.042

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

		M = 0.849 Re = 11.0 x 10 ⁶										FLOOR AND CEILING WITH 4.9% POROSITY									
ALPHA	CN																				
		1.283	0.693	0.192	-0.481	-1.377	-1.887	-2.585	-3.070	-3.546	-4.261	-4.928	-5.577	-6.159	-6.733	-7.307	-7.881	-8.455	-9.029	-9.603	-10.177
CM	CM	0.179	0.107	0.028	-0.036	-0.120	-0.199	-0.206	-0.120	-0.029	-0.013	-0.009	-0.548	-0.620	-0.795	-0.969	-1.144	-1.318	-1.493	-1.667	-1.842
		-0.009	0.004	0.016	0.012	0.016	0.016	0.009	0.012	0.009	0.009	0.009	0.039	0.058	0.092	0.113	0.124	0.135	0.146	0.157	0.168
DCP 1	-0.010	-0.835	-1.147	-1.326	-1.387	-1.526	-1.645	-1.684	-1.868	-1.911	-1.947	-2.130	-2.100	-2.260	-2.433	-2.606	-2.779	-2.952	-3.125	-3.298	-3.471
DCP 2	-0.020	-0.682	-0.812	-0.898	-1.091	-1.227	-1.355	-1.438	-1.565	-1.651	-1.728	-1.806	-1.856	-1.999	-2.137	-2.280	-2.423	-2.566	-2.709	-2.852	-2.995
DCP 3	-0.030	-0.429	-0.634	-0.764	-0.868	-1.010	-1.147	-1.233	-1.359	-1.439	-1.519	-1.600	-1.634	-1.806	-1.949	-2.092	-2.235	-2.378	-2.521	-2.664	-2.807
DCP 4	-0.049	-0.021	-0.090	-0.253	-0.450	-0.582	-0.735	-0.831	-0.982	-1.071	-1.149	-1.232	-1.262	-1.484	-1.627	-1.770	-1.913	-2.056	-2.199	-2.342	-2.485
DCP 5	-0.074	0.083	-0.016	-0.095	-0.187	-0.275	-0.319	-0.363	-0.520	-0.654	-0.787	-0.898	-0.927	-1.149	-1.292	-1.435	-1.578	-1.721	-1.864	-2.007	-2.150
DCP 6	-0.099	0.369	0.282	0.114	0.023	-0.053	-0.155	-0.236	-0.431	-0.570	-0.684	-0.780	-0.809	-1.031	-1.174	-1.317	-1.460	-1.603	-1.746	-1.889	-2.032
DCP 7	-0.149	0.459	0.381	0.304	0.135	0.038	-0.062	-0.164	-0.415	-0.526	-0.631	-0.725	-0.754	-0.976	-1.119	-1.262	-1.405	-1.548	-1.691	-1.834	-1.977
DCP 8	-0.200	0.410	0.338	0.273	0.092	-0.002	-0.126	-0.312	-0.464	-0.548	-0.630	-0.706	-0.735	-0.957	-1.100	-1.243	-1.386	-1.529	-1.672	-1.815	-1.958
DCP 9	-0.250	0.419	0.326	0.239	0.115	0.029	-0.184	-0.308	-0.453	-0.532	-0.608	-0.682	-0.711	-0.933	-1.076	-1.219	-1.362	-1.505	-1.648	-1.791	-1.934
DCP 10	-0.300	0.434	0.348	0.258	0.202	-0.001	-0.146	-0.251	-0.360	-0.438	-0.515	-0.596	-0.625	-0.847	-1.000	-1.143	-1.286	-1.429	-1.572	-1.715	-1.858
DCP 11	-0.399	0.406	0.343	0.247	0.147	-0.033	-0.259	-0.260	-0.383	-0.471	-0.528	-0.569	-0.598	-0.820	-0.973	-1.116	-1.259	-1.402	-1.545	-1.688	-1.831
DCP 12	-0.501	0.338	0.279	0.196	0.093	-0.028	-0.217	-0.290	-0.401	-0.428	-0.451	-0.502	-0.531	-0.753	-0.906	-1.049	-1.192	-1.335	-1.478	-1.621	-1.764
DCP 13	-0.600	0.324	0.270	0.194	0.069	-0.063	-0.112	-0.203	-0.341	-0.405	-0.451	-0.502	-0.531	-0.753	-0.906	-1.049	-1.192	-1.335	-1.478	-1.621	-1.764
DCP 14	-0.701	0.330	0.281	0.225	0.146	-0.060	-0.005	-0.101	-0.200	-0.247	-0.295	-0.337	-0.366	-0.588	-0.741	-0.884	-1.027	-1.170	-1.313	-1.456	-1.599
DCP 15	-0.800	-0.161	-0.274	-0.382	-0.412	-0.423	-0.316	-0.197	-0.405	-0.427	-0.450	-0.472	-0.501	-0.723	-0.876	-1.019	-1.162	-1.305	-1.448	-1.591	-1.734
DCP 16	-0.900	-0.358	-0.467	-0.506	-0.412	-0.090	-0.021	0.016	0.096	0.127	0.150	0.172	0.201	-0.223	-0.376	-0.519	-0.662	-0.805	-0.948	-1.091	-1.234
DCP 17	-0.969	-0.124	-0.038	-0.012	-0.018	-0.013	-0.006	0.036	0.032	0.166	0.343	0.309	0.039	-0.223	-0.376	-0.519	-0.662	-0.805	-0.948	-1.091	-1.234

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

M = 0.849 Rn = 11.0 x 10⁶

ALPHA CM	1.900 -0.162 0.007	-1.359 -0.127 0.017	-0.668 -0.036 0.009	-0.086 0.026 0.016	0.924 0.104 0.008	1.301 0.181 -0.005	1.737 0.247 -0.018	2.370 0.310 -0.023	2.898 0.384 -0.045	3.573 0.479 -0.077	4.422 0.584 -0.113
DCP 1	-1.609	-1.542	-1.391	-1.267	-1.013	-0.800	-0.623	-0.498	-0.419	-0.277	-0.032
DCP 2	-1.337	-1.244	-1.099	-0.910	-0.825	-0.688	-0.540	-0.370	-0.240	-0.102	0.023
DCP 3	-1.107	-1.021	-0.876	-0.770	-0.623	-0.408	-0.287	-0.145	-0.042	0.083	0.195
DCP 4	-0.703	-0.591	-0.462	-0.306	-0.094	-0.005	0.089	0.215	0.309	0.398	0.485
DCP 5	-0.288	-0.260	-0.179	-0.096	-0.008	0.113	0.234	0.366	0.448	0.536	0.622
DCP 6	-0.122	-0.058	0.029	0.115	0.295	0.399	0.466	0.557	0.621	0.695	0.773
DCP 7	-0.041	0.031	0.126	0.293	0.376	0.476	0.534	0.624	0.684	0.749	0.819
DCP 8	-0.089	-0.006	0.085	0.269	0.342	0.426	0.492	0.582	0.647	0.718	0.783
DCP 9	-0.148	-0.028	0.103	0.236	0.332	0.434	0.503	0.587	0.650	0.712	0.781
DCP 10	-0.083	-0.004	0.184	0.252	0.355	0.448	0.507	0.581	0.639	0.693	0.753
DCP 11	-0.201	-0.051	0.142	0.241	0.343	0.412	0.462	0.533	0.583	0.642	0.706
DCP 12	-0.204	-0.044	0.092	0.187	0.281	0.347	0.400	0.471	0.519	0.575	0.633
DCP 13	-0.082	-0.067	0.056	0.191	0.277	0.339	0.385	0.460	0.508	0.558	0.616
DCP 14	-0.024	0.053	0.151	0.225	0.284	0.340	0.423	0.504	0.545	0.608	0.665
DCP 15	-0.182	-0.426	-0.435	-0.354	-0.311	-0.219	-0.072	-0.047	0.133	0.400	0.806
DCP 16	-0.060	-0.087	-0.159	-0.522	-0.500	-0.403	-0.265	-0.227	-0.100	0.018	0.173
DCP 17	0.015	-0.025	-0.036	-0.008	-0.056	-0.099	-0.307	-0.424	-0.368	-0.240	-0.153

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

ALPHA CM	4.942 0.670 -0.142	5.317 0.749 -0.168	5.989 0.812 -0.182	6.448 0.870 -0.191	7.271 0.926 -0.200	7.916 0.982 -0.208	8.463 1.038 -0.217	8.975 1.092 -0.225
DCP 1	-0.010	0.255	0.386	0.552	0.643	0.780	0.922	1.075
DCP 2	-0.020	0.263	0.388	0.523	0.649	0.771	0.898	1.026
DCP 3	-0.030	0.398	0.498	0.605	0.713	0.824	0.928	1.025
DCP 4	-0.049	0.662	0.756	0.845	0.934	1.024	1.114	1.201
DCP 5	-0.074	0.778	0.866	0.964	1.053	1.136	1.217	1.298
DCP 6	-0.099	0.920	0.994	1.070	1.154	1.233	1.315	1.387
DCP 7	-0.149	0.944	1.017	1.091	1.162	1.232	1.299	1.371
DCP 8	-0.200	0.844	0.968	1.038	1.108	1.179	1.248	1.317
DCP 9	-0.250	0.898	0.964	1.026	1.091	1.161	1.229	1.291
DCP 10	-0.300	0.812	0.866	0.924	1.051	1.112	1.175	1.234
DCP 11	-0.399	0.765	0.817	0.842	0.999	1.064	1.125	1.183
DCP 12	-0.501	0.688	0.742	0.858	0.914	0.974	1.036	1.093
DCP 13	-0.600	0.672	0.723	0.836	0.893	0.949	1.001	1.054
DCP 14	-0.701	0.743	0.794	0.889	0.939	0.989	1.034	1.081
DCP 15	-0.801	0.875	0.920	1.007	1.045	1.080	1.121	1.152
DCP 16	-0.900	0.497	0.764	0.821	0.853	0.882	0.916	0.946
DCP 17	-0.969	-0.098	0.042	0.251	0.269	0.279	0.297	0.317

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

FLOOR AND CEILING WITH 4.9% POROSITY

ALPHA	-6.757	-4.148	-3.615	-3.094	-2.258	-1.626	-0.976	-0.517	-0.074	0.721	1.276
FCN	-0.460	-0.391	-0.321	-0.253	-0.180	-0.104	-0.033	0.041	0.124	0.197	0.259
CM	0.041	0.031	0.020	0.008	-0.005	-0.019	-0.032	-0.047	-0.063	-0.076	-0.085
DCP 1	0.010	-1.743	-1.641	-1.552	-1.478	-1.432	-1.377	-1.288	-1.159	-0.990	-0.778
DCP 2	0.020	-1.610	-1.505	-1.413	-1.329	-1.274	-1.214	-1.063	-0.934	-0.822	-0.719
DCP 3	0.030	-1.415	-1.325	-1.241	-1.156	-1.071	-0.995	-0.836	-0.785	-0.685	-0.510
DCP 4	0.049	-1.059	-0.967	-0.869	-0.785	-0.693	-0.628	-0.528	-0.369	-0.282	-0.082
DCP 5	0.074	-0.804	-0.703	-0.599	-0.504	-0.415	-0.328	-0.245	-0.090	-0.006	0.074
DCP 6	0.099	-0.662	-0.5	-0.455	-0.361	-0.262	-0.178	-0.100	0.062	0.119	0.215
DCP 7	0.149	-0.631	-0.5	-0.409	-0.319	-0.222	-0.103	-0.099	0.140	0.262	0.347
DCP 8	0.200	-0.625	-0.530	-0.424	-0.316	-0.187	-0.080	0.052	0.133	0.282	0.345
DCP 9	0.250	-0.609	-0.526	-0.443	-0.347	-0.244	-0.133	0.043	0.158	0.244	0.306
DCP10	0.300	-0.507	-0.424	-0.345	-0.271	-0.170	-0.072	0.010	0.214	0.271	0.333
DCP11	0.399	-0.527	-0.452	-0.362	-0.295	-0.203	-0.116	-0.042	0.194	0.253	0.317
DCP12	0.501	-0.485	-0.433	-0.343	-0.253	-0.152	-0.052	-0.035	0.163	0.222	0.278
DCP13	0.600	-0.441	-0.386	-0.333	-0.266	-0.186	-0.119	-0.027	0.149	0.223	0.275
DCP14	0.701	-0.321	-0.257	-0.196	-0.141	-0.077	0.003	0.119	0.186	0.248	0.315
DCP15	0.800	-0.045	0.002	0.052	0.107	0.167	0.211	0.252	0.379	0.544	0.485
DCP16	0.900	-0.055	0.035	0.035	0.035	0.090	0.140	0.181	0.273	0.352	0.352
DCP17	0.969	-0.311	-0.284	-0.263	-0.225	-0.184	-0.150	-0.124	-0.063	-0.011	0.022

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

ALPHA	1.90C	2.66C	3.179	3.720	4.313
CN	0.327	0.400	0.470	0.536	0.610
CCM	-0.096	-0.109	-0.119	-0.130	-0.145
DCP 1	-0.665	-0.545	-0.298	-0.146	0.026
DCP 2	-0.559	-0.421	-0.268	-0.118	0.042
DCP 3	-0.353	-0.202	-0.068	0.055	0.183
DCP 4	0.017	0.139	0.273	0.381	0.490
DCP 5	0.074	0.311	0.414	0.504	0.613
DCP 6	0.095	0.341	0.538	0.616	0.704
DCP 7	0.149	0.424	0.596	0.766	0.766
DCP 8	0.200	0.508	0.600	0.656	0.737
DCP 9	0.250	0.373	0.563	0.641	0.722
DCP10	0.300	0.410	0.574	0.633	0.717
DCP11	0.399	0.389	0.452	0.598	0.661
DCP12	0.501	0.340	0.475	0.541	0.614
DCP13	0.600	0.335	0.464	0.521	0.580
DCP14	0.701	0.369	0.429	0.564	0.631
DCP15	0.800	0.533	0.654	0.709	0.766
DCP16	0.900	0.405	0.522	0.574	0.651
DCP17	0.969	0.064	0.082	0.097	0.120

FLOOR AND CEILING WITH 4.9% POROSITY

$$M = 0.901 \quad R_n = 7.2 \times 10^6$$

**REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR**

ALPHA	-0.407	-1.316	-2.126	-3.051	-4.140	-5.024	-6.238	-7.077	-7.855
EN	0.073	-0.037	-0.164	-0.283	-0.390	-0.492	-0.585	-0.766	-0.862
CM	-0.050	-0.029	-0.007	0.013	0.030	0.048	0.064	0.079	0.054
010	-1.285	-1.404	-1.537	-1.805	-1.952	-1.871	-1.961	-2.088	-2.177
020	-0.995	-1.159	-1.310	-1.549	-1.543	-1.673	-1.780	-1.904	-2.019
030	-0.752	-0.942	-1.080	-1.206	-1.338	-1.470	-1.588	-1.729	-1.838
040	-0.516	-0.570	-0.744	-0.865	-1.004	-1.147	-1.260	-1.406	-1.522
050	-0.074	-0.170	-0.313	-0.512	-0.685	-0.841	-0.988	-1.133	-1.260
060	0.048	-0.029	-0.131	-0.322	-0.518	-0.695	-0.853	-1.014	-1.133
070	0.111	0.004	-0.156	-0.343	-0.522	-0.671	-0.796	-0.934	-1.052
080	0.117	0.006	-0.167	-0.365	-0.522	-0.655	-0.783	-0.909	-1.015
090	0.081	-0.010	-0.208	-0.375	-0.506	-0.625	-0.733	-0.855	-0.960
100	0.118	0.012	-0.165	-0.311	-0.449	-0.543	-0.651	-0.766	-0.862
110	0.140	-0.066	-0.215	-0.307	-0.451	-0.556	-0.640	-0.751	-0.831
120	0.135	-0.067	-0.262	-0.315	-0.419	-0.518	-0.605	-0.720	-0.798
130	0.061	-0.052	-0.161	-0.300	-0.387	-0.464	-0.570	-0.653	-0.727
140	0.030	-0.055	-0.074	-0.177	-0.243	-0.325	-0.420	-0.544	-0.621
150	0.130	0.055	0.074	-0.177	-0.243	-0.325	-0.420	-0.544	-0.621
160	0.328	0.234	0.192	0.064	0.007	-0.087	-0.135	-0.202	-0.259
170	0.228	0.181	0.119	0.025	0.007	-0.104	-0.150	-0.246	-0.353
180	-0.069	-0.136	-0.156	-0.256	-0.313	-0.386	-0.412	-0.371	-0.376

[illegible]

FLOOR AND CEILING WITH 4.9% POROSITY

$$M = 0.999 \quad R_n = 11.0 \times 10^6$$

	ALPHA	-1.918	-1.337	-0.692	0.194	0.655	1.047	1.728	2.378	2.949	3.730
CN	-0.117	-0.050	0.015	0.078	0.151	0.222	0.222	0.297	0.364	0.423	0.485
CM	-0.016	-0.079	-0.041	-0.054	-0.068	-0.080	-0.080	-0.093	-0.103	-0.113	-0.121
OCP 1	-1.501	-1.476	-1.420	-1.357	-1.324	-1.031	-0.811	-0.662	-0.658	-0.344	
OCP 2	-1.268	-1.204	-1.120	-0.993	-0.855	-0.787	-0.690	-0.522	-0.373	-0.226	
OCP 3	-1.069	-0.998	-0.896	-0.796	-0.721	-0.635	-0.441	-0.293	-0.146	-0.040	
OCP 4	-0.693	-0.605	-0.514	-0.426	-0.324	-0.138	-0.050	0.058	0.160	0.270	
OCP 5	-0.263	-0.233	-0.201	-0.145	-0.086	-0.018	0.055	0.194	0.319	0.423	
OCP 6	-0.099	-0.073	-0.005	0.040	0.118	0.161	0.325	0.407	0.484	0.571	
OCP 7	-0.038	0.020	0.080	0.137	0.184	0.334	0.413	0.488	0.557	0.632	
OCP 8	-0.088	0.014	0.048	0.106	0.140	0.299	0.370	0.451	0.526	0.603	
OCP 9	-0.156	-0.035	0.020	0.083	0.207	0.282	0.364	0.452	0.525	0.601	
DCP10	-0.300	-0.099	0.059	0.124	0.227	0.299	0.385	0.466	0.531	0.590	
DCP11	-0.461	-0.088	0.029	0.161	0.200	0.280	0.359	0.426	0.479	0.544	
DCP12	-0.501	-0.225	0.053	0.090	0.166	0.236	0.310	0.367	0.416	0.480	
DCP13	-0.113	-0.058	-0.017	0.044	0.170	0.240	0.311	0.359	0.412	0.472	
DCP14	-0.006	0.081	0.096	0.144	0.199	0.252	0.334	0.389	0.451	0.511	
DCP15	0.215	0.348	0.290	0.348	0.409	0.469	0.517	0.572	0.617	0.657	
DCP16	-0.143	0.182	0.218	0.246	0.303	0.351	0.398	0.446	0.493	0.523	
DCP17	-0.160	-0.131	-0.099	-0.056	-0.017	0.015	0.047	0.092	0.118	0.121	

[illegible]

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MEASURED DRAG COEFFICIENTS

Airfoil: NLR7223-62				Test: BSWT567			
M = 0.6 Re = 10 x 10 ⁶		M = 0.7 Re = 11 x 10 ⁶		M = 0.75 Re = 11.4 x 10 ⁶		M = 0.8 Re = 11.7 x 10 ⁶	
α	C_d	α	C_d	α	C_d	α	C_d
- 2.0	0.0092	-2.06	0.0088	-2.15	0.0093	-2.04	0.0159
- 1.98	0.0081	-1.33	0.0073	-2.10	0.0108	-1.01	0.0102
- 1.91	0.0082	-1.12	0.0083	-1.6	0.0070	-1.01	0.0100
0.58	0.0077	1.01	0.0083	-1.24	0.0083	-0.03	0.0107
0.71	0.0075	1.95	0.0104	-1.01	0.0082	-0.02	0.0099
1.07	0.0069	3.12	0.01367	0.15	0.0076	0.76	0.0120
2.10	0.0070	3.95	0.0228	0.91	0.0096	0.93	0.014
2.10	0.0076	5.05	0.0416	0.96	0.0089		
3.03	0.0082			1.12	0.0099		
4.07	0.0082			1.69	0.0158		
4.11	0.0081			1.99	0.0160		
5.06	0.0118			2.72	0.0223		
5.74	0.0176			2.87	0.0255		
5.79	0.0179						
6.02	0.0179						
7.04	0.0290						
7.95	0.0453						
9.01	0.0560						
10.09	0.0803						

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.201 Rn = 3.2 x 10⁶

SOLID FLOOR AND CEILING

ALPHA CN CM	-1.887 -0.459 -0.044	-7.305 -0.437 -0.031	-6.652 -0.469 -0.032	-6.069 -0.403 -0.033	-5.505 -0.357 -0.032	-4.914 -0.294 -0.033	-4.284 -0.252 -0.026	-3.728 -0.147 -0.025	-3.102 -0.075 -0.026	-2.506 -0.075 -0.026	-1.847 -0.022 -0.026
DCP 1	-2.418	-2.518	-5.307	-4.764	-4.360	-3.824	-3.544	-2.931	-2.504	-2.162	-1.682
DCP 2	-2.362	-2.697	-3.459	-3.165	-2.860	-2.590	-2.429	-2.160	-1.835	-1.492	-1.292
DCP 3	-2.218	-2.837	-2.476	-2.232	-2.034	-1.832	-1.593	-1.403	-1.123	-0.954	-0.654
DCP 4	-2.737	-2.131	-2.139	-1.889	-1.733	-1.490	-1.410	-1.193	-0.979	-0.842	-0.651
DCP 5	-2.026	-1.602	-1.463	-1.298	-1.207	-0.969	-0.865	-0.752	-0.633	-0.407	-0.255
DCP 6	-1.451	-1.058	-1.025	-0.862	-0.760	-0.666	-0.450	-0.345	-0.240	-0.131	0.041
DCP 7	-1.114	-0.928	-0.866	-0.800	-0.695	-0.570	-0.513	-0.421	-0.301	-0.152	-0.091
DCP 8	-0.851	-0.700	-0.644	-0.547	-0.515	-0.378	-0.323	-0.269	-0.243	-0.115	0.009
DCP 9	-0.574	-0.617	-0.568	-0.472	-0.406	-0.296	-0.305	-0.158	-0.133	-0.034	0.021
DCP10	-0.453	-0.404	-0.442	-0.417	-0.352	-0.326	-0.203	-0.131	-0.087	0.008	0.036
DCP11	-0.277	-0.332	-0.345	-0.269	-0.224	-0.229	-0.100	-0.150	-0.038	0.053	0.047
DCP12	-0.197	-0.230	-0.281	-0.239	-0.217	-0.158	-0.156	-0.016	-0.085	0.015	0.026
DCP13	-0.075	-0.096	-0.071	-0.055	-0.032	-0.005	0.035	0.129	0.083	0.121	0.174
DCP14	-0.001	-0.057	-0.073	-0.032	-0.017	0.012	0.031	0.105	0.089	0.056	0.122
DCP15	-0.005	-0.018	-0.029	0.034	0.037	0.056	0.039	0.042	0.038	0.060	0.046
DCP16	0.036	0.009	-0.111	-0.056	-0.079	-0.045	-0.089	-0.095	-0.093	-0.051	-0.060
DCP17	0.009	-0.013	0.078	-0.017	0.016	0.040	-0.082	0.011	-0.018	-0.041	0.010
ALPHA CN CM	-1.285 0.021 -0.022	-0.712 0.082 -0.021	-0.068 0.144 -0.023	0.572 0.195 -0.020	1.104 0.265 -0.020	1.696 0.312 -0.020	2.357 0.371 -0.018	2.943 0.454 -0.022	3.521 0.528 -0.024	4.186 0.568 -0.015	4.801 0.618 -0.016
DCP 1	-1.310	-0.898	-0.577	-0.178	0.280	0.664	0.994	1.477	1.863	2.240	2.542
DCP 2	-1.053	-0.705	-0.420	-0.179	0.212	0.473	0.741	1.123	1.440	1.814	1.921
DCP 3	-0.501	-0.223	0.053	0.294	0.508	0.745	1.099	1.280	1.596	1.917	2.145
DCP 4	-0.345	-0.259	-0.073	0.175	0.401	0.615	0.745	1.065	1.255	1.456	1.713
DCP 5	-0.153	0.053	0.236	0.368	0.511	0.720	0.888	1.085	1.254	1.431	1.616
DCP 6	0.192	0.256	0.474	0.614	0.747	0.832	1.062	1.201	1.320	1.534	1.627
DCP 7	-0.003	0.088	0.237	0.293	0.478	0.579	0.620	0.782	0.955	1.016	1.057
DCP 8	0.009	0.203	0.265	0.351	0.386	0.502	0.684	0.692	0.800	0.947	0.974
DCP 9	0.114	0.150	0.233	0.301	0.467	0.448	0.502	0.633	0.678	0.716	0.789
DCP10	0.096	0.085	0.178	0.303	0.328	0.379	0.468	0.565	0.619	0.689	0.698
DCP11	0.082	0.207	0.187	0.209	0.331	0.321	0.361	0.480	0.557	0.534	0.622
DCP12	0.046	0.084	0.153	0.157	0.218	0.206	0.228	0.340	0.389	0.374	0.471
DCP13	0.143	0.251	0.249	0.252	0.305	0.333	0.351	0.348	0.443	0.473	0.464
DCP14	0.152	0.155	0.161	0.198	0.183	0.210	0.269	0.291	0.374	0.331	0.342
DCP15	0.069	0.058	0.110	0.117	0.143	0.154	0.207	0.207	0.223	0.197	0.205
DCP16	-0.056	-0.126	-0.011	-0.045	-0.044	-0.003	-0.017	0.000	-0.040	-0.002	-0.002
DCP17	-0.036	-0.029	-0.081	-0.030	-0.058	-0.014	-0.056	0.019	-0.019	-0.057	-0.035

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.201 Rn = 3.2 x 10⁶

		7.194	7.740	8.380	9.013	9.610	10.164	10.773	11.381
ALPHA		0.860	0.912	0.985	1.014	1.101	1.145	1.192	1.251
CN		-0.015	-0.011	-0.005	-0.011	-0.007	-0.007	-0.004	-0.001
DCP 1	-0.10	4.043	4.475	4.916	5.291	5.667	5.948	5.933	6.010
DCP 2	-0.20	3.050	3.560	3.848	3.999	4.380	4.750	5.008	5.210
DCP 3	-0.30	2.822	3.368	3.672	3.846	4.152	4.409	4.609	4.925
DCP 4	-0.49	2.519	2.724	3.099	3.002	3.441	3.657	3.871	3.986
DCP 5	-0.74	2.223	2.420	2.714	2.721	2.941	3.075	3.251	3.473
DCP 6	-0.99	1.987	2.318	2.387	2.530	2.768	2.898	3.022	3.233
DCP 7	-1.49	1.537	1.662	1.831	1.816	1.964	2.117	2.255	2.354
DCP 8	-2.00	1.392	1.417	1.493	1.642	1.678	1.681	1.824	1.950
DCP 9	-2.50	1.120	1.217	1.290	1.337	1.492	1.494	1.632	1.704
DCP 10	-3.00	0.990	1.051	1.109	1.139	1.231	1.315	1.332	1.397
DCP 11	-3.99	0.828	0.826	0.992	0.940	1.076	1.037	1.090	1.194
DCP 12	-5.01	0.586	0.630	0.686	0.704	0.736	0.825	0.818	0.893
DCP 13	-6.00	0.613	0.624	0.685	0.640	0.745	0.753	0.740	0.707
DCP 14	-7.01	0.385	0.514	0.500	0.476	0.515	0.488	0.504	0.555
DCP 15	-8.00	0.327	0.259	0.260	0.318	0.282	0.318	0.299	0.266
DCP 16	-9.00	0.036	-0.024	-0.002	0.035	0.005	0.001	0.051	0.031
DCP 17	-9.69	-0.094	-0.052	-0.094	-0.020	-0.049	-0.019	-0.018	-0.009

REPRODUCIBILITY OF THE ORIGINAL PAGE IS DOUBT

		13.812	14.384	14.972	15.547	16.743	17.570	19.126	19.702
ALPHA		1.305	1.377	1.297	1.315	1.227	1.697	1.173	1.107
CN		3.010	-0.001	-0.010	-0.066	-0.081	-0.118	-0.143	-0.114
DCP 1	-0.10	6.627	7.124	6.802	5.171	5.168	2.370	1.809	1.848
DCP 2	-0.20	5.908	6.240	5.964	4.446	4.259	2.113	1.642	1.791
DCP 3	-0.30	5.462	5.823	5.558	3.681	3.520	2.176	1.842	1.751
DCP 4	-0.49	4.255	4.324	3.993	3.935	3.683	3.065	3.564	3.586
DCP 5	-0.74	3.696	3.735	3.268	3.250	2.865	2.413	2.738	2.742
DCP 6	-0.99	3.324	3.414	2.923	2.719	2.440	2.222	2.241	2.241
DCP 7	-1.49	2.476	2.473	2.207	1.588	1.772	1.609	1.762	1.804
DCP 8	-2.00	2.089	2.122	1.994	1.873	1.655	1.445	1.343	1.374
DCP 9	-2.50	1.714	1.858	1.788	1.716	1.489	1.203	1.309	1.201
DCP 10	-3.00	1.512	1.559	1.544	1.647	1.347	1.218	1.155	1.192
DCP 11	-3.99	1.204	1.282	1.287	1.482	1.306	1.232	1.194	1.147
DCP 12	-5.01	0.936	0.936	0.947	1.061	0.990	0.997	0.985	0.985
DCP 13	-6.00	0.768	0.832	0.763	0.921	0.972	1.047	1.105	1.087
DCP 14	-7.01	0.476	0.598	0.491	0.681	0.739	0.785	0.838	0.838
DCP 15	-8.00	0.257	0.317	0.295	0.536	0.516	0.516	0.572	0.733
DCP 16	-9.00	0.026	0.064	0.143	0.198	0.382	0.370	0.831	0.347
DCP 17	-9.69	-0.031	-0.044	-0.006	0.120	0.106	0.115	0.092	0.081

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.301 Re = 4.8 x 10⁶

SOLID FLOOR AND CEILING

ALPHA CM	3.428 0.500 -0.014	4.230 0.552 -0.011	4.854 0.618 -0.010	5.501 0.682 -0.009	6.035 0.745 -0.011	6.438 0.797 -0.008	7.341 0.862 -0.008	7.857 0.912 -0.006	8.466 0.968 -0.002	9.042 1.028 -0.001	9.670 1.081 -0.002
DCP 1	-0.010	1.893	2.252	3.041	3.430	3.804	4.198	4.707	5.122	5.388	5.542
DCP 2	-0.020	1.583	1.921	2.501	2.829	3.119	3.469	3.738	4.131	4.373	4.600
DCP 3	-0.030	1.584	1.914	2.412	2.583	2.862	3.162	3.395	3.670	3.908	4.144
DCP 4	-0.049	1.454	1.674	2.139	2.355	2.553	2.757	2.981	3.237	3.405	3.572
DCP 5	-0.074	1.323	1.524	1.895	2.016	2.218	2.408	2.558	2.710	2.934	3.065
DCP 6	-0.099	1.298	1.378	1.720	1.840	1.942	2.152	2.282	2.396	2.551	2.681
DCP 7	-0.149	0.933	1.044	1.242	1.382	1.511	1.607	1.687	1.838	1.932	1.993
DCP 8	-0.200	0.719	0.822	1.041	1.107	1.219	1.262	1.365	1.466	1.557	1.648
DCP 9	-0.250	0.640	0.717	0.892	0.975	1.035	1.114	1.171	1.271	1.338	1.424
DCP 10	-0.300	0.599	0.641	0.782	0.845	0.920	0.970	1.045	1.099	1.158	1.200
DCP 11	-0.399	0.496	0.555	0.616	0.732	0.748	0.791	0.823	0.862	0.932	1.017
DCP 12	-0.501	0.362	0.359	0.441	0.530	0.546	0.623	0.635	0.665	0.721	0.776
DCP 13	-0.600	0.331	0.357	0.374	0.445	0.480	0.519	0.553	0.596	0.580	0.605
DCP 14	-0.701	0.349	0.370	0.417	0.449	0.447	0.477	0.445	0.490	0.508	0.521
DCP 15	-0.800	0.106	0.188	0.217	0.243	0.258	0.271	0.249	0.270	0.301	0.295
DCP 16	-0.920	-0.050	-0.046	-0.054	-0.025	-0.050	-0.018	0.026	-0.022	-0.046	-0.011
DCP 17	-0.969	-0.012	-0.026	-0.042	-0.047	-0.006	-0.050	-0.036	-0.051	-0.018	-0.030

ALPHA CM	10.274 1.125 0.003	10.665 1.172 0.004	11.447 1.202 0.007	12.124 1.251 0.007	12.626 1.267 0.009	13.226 1.268 0.011	13.818 1.196 0.003	14.505 1.234 -0.005	15.011 1.170 -0.074	15.641 1.127 -0.066	16.245 1.227 -0.070
DCP 1	-0.010	5.559	6.779	7.273	7.692	7.777	7.028	6.459	4.798	4.681	4.840
DCP 2	-0.020	4.900	5.147	5.443	5.520	5.794	5.662	5.338	4.097	4.205	4.189
DCP 3	-0.030	4.402	4.645	5.025	5.094	5.232	5.081	4.725	3.675	3.775	3.166
DCP 4	-0.049	3.805	4.090	4.228	4.359	4.358	3.901	4.176	3.287	3.257	3.601
DCP 5	-0.074	3.188	3.357	3.590	3.603	3.641	3.178	3.461	2.536	2.425	2.901
DCP 6	-0.099	2.816	2.940	3.141	3.184	3.120	2.736	2.995	2.129	2.36	2.399
DCP 7	-0.149	2.116	2.258	2.325	2.384	2.400	2.192	2.206	1.694	1.674	2.005
DCP 8	-0.200	1.692	1.842	1.876	1.901	1.944	1.814	1.912	1.503	1.512	1.797
DCP 9	-0.250	1.468	1.534	1.628	1.692	1.645	1.637	1.607	1.559	1.408	1.606
DCP 10	-0.300	1.269	1.331	1.391	1.421	1.380	1.421	1.433	1.380	1.404	1.483
DCP 11	-0.399	1.036	1.035	1.125	1.118	1.110	1.125	1.122	1.318	1.172	1.230
DCP 12	-0.501	0.798	0.793	0.884	0.856	0.816	0.846	0.884	1.040	1.011	1.045
DCP 13	-0.600	0.629	0.625	0.677	0.649	0.665	0.620	0.664	0.884	0.808	0.925
DCP 14	-0.701	0.522	0.544	0.550	0.518	0.548	0.454	0.485	0.724	0.692	0.737
DCP 15	-0.800	0.285	0.299	0.279	0.293	0.272	0.259	0.312	0.524	0.472	0.483
DCP 16	-0.900	-0.001	0.008	0.014	0.056	0.042	0.083	0.119	0.194	0.242	0.192
DCP 17	-0.969	-0.061	-0.053	-0.016	-0.001	-0.010	0.035	0.051	0.065	0.039	0.140

ALFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.301 $B_n = 4.8 \times 10^6$

ALPHA	16.852	17.416	18.003	18.617	19.242	19.792
CN	1.007	1.003	1.038	0.966	1.011	0.990
CN	-0.101	-0.091	-0.090	-0.095	-0.102	-0.093
DCP 1	4.031	3.909	3.914	3.568	3.615	3.725
DCP 2	3.691	3.642	3.642	3.369	3.262	3.289
DCP 3	3.789	3.646	3.091	3.322	2.934	2.045
DCP 4	2.034	2.087	2.497	1.858	1.909	2.229
DCP 5	1.414	1.435	1.768	1.430	1.546	1.751
DCP 6	1.315	1.428	1.628	1.371	1.470	1.643
DCP 7	1.205	1.318	1.496	1.254	1.391	1.490
DCP 8	1.215	1.231	1.422	1.253	1.363	1.382
DCP 9	1.276	1.285	1.348	1.212	1.351	1.265
DCP 10	1.174	1.258	1.250	1.202	1.244	1.192
DCP 11	1.149	1.188	1.124	1.103	1.097	1.091
DCP 12	1.040	1.029	1.155	0.912	1.080	0.958
DCP 13	0.917	0.816	1.830	0.831	0.895	0.785
DCP 14	0.787	0.710	0.736	0.741	0.696	0.686
DCP 15	0.543	0.495	0.528	0.534	0.550	0.568
DCP 16	0.244	0.264	0.290	0.257	0.302	0.290
DCP 17	0.104	0.100	0.112	0.123	0.121	0.094

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE	X/C	M = 0.400	Rn = 2.3 x 10 ⁶	SOLID FLOOR AND CEILING									
ALPHA		-8.284	-7.801	-7.278	-6.785	-6.234	-5.727	-5.209	-4.697	-4.145	-3.661	-3.107	
CN		-0.545	-0.567	-0.542	-0.503	-0.462	-0.446	-0.395	-0.372	-0.303	-0.245	-0.194	
CM		-0.010	-0.016	-0.027	-0.036	-0.046	-0.036	-0.036	-0.034	-0.029	-0.027	-0.020	
DCP 1	0.010	-2.265	-2.365	-2.194	-2.263	-2.362	-2.477	-2.569	-3.253	-3.663	-3.220	-2.740	
DCP 2	0.020	-2.293	-2.401	-2.211	-2.313	-2.366	-2.427	-2.440	-2.600	-2.473	-2.084	-1.759	
DCP 3	0.030	-2.294	-2.451	-1.958	-1.965	-2.007	-2.051	-2.168	-2.246	-1.802	-1.597	-1.354	
DCP 4	0.040	-1.763	-1.758	-1.863	-1.960	-2.053	-2.032	-2.081	-2.023	-1.334	-1.147	-0.989	
DCP 5	0.050	-1.565	-1.559	-1.707	-1.742	-1.865	-1.768	-1.715	-1.554	-0.977	-0.763	-0.616	
DCP 6	0.060	-1.326	-1.365	-1.465	-1.540	-1.580	-1.509	-1.214	-1.019	-0.656	-0.553	-0.398	
DCP 7	0.070	-1.357	-1.353	-1.414	-1.364	-1.455	-1.273	-0.958	-0.690	-0.430	-0.333	-0.216	
DCP 8	0.080	-1.129	-1.125	-1.137	-1.017	-0.869	-0.724	-0.556	-0.454	-0.330	-0.337	-0.237	
DCP 9	0.090	-1.065	-1.047	-1.005	-0.834	-0.695	-0.600	-0.436	-0.441	-0.406	-0.337	-0.237	
DCP10	0.100	-0.919	-0.877	-0.767	-0.644	-0.497	-0.467	-0.409	-0.357	-0.341	-0.268	-0.179	
DCP11	0.110	-0.651	-0.583	-0.516	-0.361	-0.345	-0.333	-0.255	-0.257	-0.276	-0.149	-0.120	
DCP12	0.120	-0.347	-0.394	-0.278	-0.277	-0.160	-0.163	-0.203	-0.175	-0.156	-0.109	-0.102	
DCP13	0.130	-0.226	-0.290	-0.131	-0.101	-0.064	-0.070	-0.054	-0.064	-0.046	-0.006	-0.045	
DCP14	0.140	-0.078	-0.026	0.001	0.051	0.077	0.001	0.022	0.024	0.075	0.069	0.060	
DCP15	0.150	0.010	0.013	0.092	0.074	0.083	0.082	0.074	0.068	0.092	0.076	0.060	
DCP16	0.160	-0.093	-0.090	-0.065	-0.067	-0.054	-0.073	-0.062	-0.113	-0.117	-0.101	-0.103	
DCP17	0.170	-0.052	-0.038	-0.088	-0.014	0.031	-0.019	-0.024	-0.001	-0.031	-0.044	-0.030	

DATA TYPE	X/C	2.584	-2.071	-1.534	-1.014	-0.486	0.073	0.554	1.092	1.636	2.137	2.649	
ALPHA		-2.584	-2.071	-1.534	-1.014	-0.486	0.073	0.554	1.092	1.636	2.137	2.649	
CN		-0.133	-0.073	-0.008	0.045	0.113	0.171	0.214	0.262	0.345	0.404	0.453	
CM		-0.023	-0.020	-0.019	0.018	-0.020	-0.017	-0.008	-0.012	-0.013	-0.008	-0.003	
DCP 1	0.010	-2.192	-1.760	-1.354	-0.890	-0.514	-0.121	0.317	0.676	1.077	1.493	1.872	
DCP 2	0.020	-1.534	-1.445	-1.074	-0.754	-0.462	-0.214	0.122	0.439	0.742	1.006	1.380	
DCP 3	0.030	-1.092	-0.854	-0.607	-0.345	-0.068	0.175	0.444	0.683	0.945	1.235	1.516	
DCP 4	0.040	-0.603	-0.577	-0.413	-0.156	0.306	0.263	0.457	0.683	0.841	1.099	1.321	
DCP 5	0.050	-0.260	-0.260	-0.057	0.034	0.228	0.398	0.547	0.754	0.936	1.106	1.254	
DCP 6	0.060	-0.254	-0.029	0.095	0.212	0.336	0.465	0.672	0.780	0.934	1.153	1.237	
DCP 7	0.070	-0.250	-0.151	-0.057	0.033	0.173	0.269	0.368	0.450	0.592	0.741	0.854	
DCP 8	0.080	-0.162	-0.045	0.058	0.107	0.244	0.305	0.413	0.463	0.572	0.668	0.757	
DCP 9	0.090	-0.203	-0.056	0.025	0.042	0.155	0.217	0.276	0.350	0.462	0.539	0.563	
DCP10	0.100	-0.137	-0.062	0.024	0.077	0.136	0.237	0.281	0.338	0.364	0.441	0.533	
DCP11	0.110	-0.054	-0.034	0.045	0.068	0.126	0.223	0.250	0.314	0.345	0.381	0.459	
DCP12	0.120	-0.042	-0.031	0.031	0.059	0.142	0.216	0.200	0.217	0.305	0.337	0.332	
DCP13	0.130	0.037	0.072	0.066	0.152	0.180	0.216	0.200	0.235	0.256	0.249	0.324	
DCP14	0.140	0.123	0.127	0.136	0.163	0.170	0.193	0.200	0.225	0.264	0.310	0.301	
DCP15	0.150	0.093	0.114	0.127	0.115	0.163	0.127	0.137	0.147	0.175	0.149	0.157	
DCP16	0.160	-0.061	-0.114	-0.094	-0.115	-0.073	-0.111	-0.137	-0.071	-0.078	-0.090	-0.131	
DCP17	0.170	-0.072	-0.061	-0.053	-0.046	-0.065	-0.016	-0.000	-0.075	-0.065	-0.072	-0.064	

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

DATA TYPE	X/C	M = 0.400	Rn = 2.3 x 10 ⁶	SOLID FLOOR AND CEILING									
ALPHA:													
CN		3.169	3.708	4.237	4.722	5.286	5.792	6.287	6.818	7.369	7.848	8.391	
CM		0.530	0.594	0.651	0.717	0.768	0.829	0.861	0.914	0.950	1.009	1.030	
		-0.009	-0.009	-0.003	-0.004	-0.003	0.002	0.006	0.008	0.013	0.014	0.016	
DCP 1	0.010	2.258	2.654	3.021	3.424	3.744	4.205	4.566	5.057	5.541	6.021	6.257	
DCP 2	0.020	1.711	2.023	2.267	2.683	2.870	3.328	3.794	3.894	4.205	5.151	5.673	
DCP 3	0.030	1.777	2.092	2.354	2.631	2.905	3.052	3.213	3.459	3.597	3.761	4.023	
DCP 4	0.040	1.573	1.757	1.996	2.259	2.450	2.683	2.859	3.072	3.214	3.361	3.436	
DCP 5	0.050	1.453	1.645	1.792	2.022	2.157	2.377	2.478	2.644	2.761	2.921	2.956	
DCP 6	0.060	1.410	1.561	1.775	1.865	2.016	2.205	2.271	2.393	2.523	2.620	2.675	
DCP 7	0.070	0.937	1.024	1.150	1.300	1.368	1.505	1.597	1.678	1.762	1.846	1.876	
DCP 8	0.080	0.870	0.976	1.071	1.168	1.213	1.336	1.372	1.485	1.495	1.544	1.649	
DCP 9	0.090	0.721	0.731	0.871	0.937	1.032	1.102	1.135	1.201	1.250	1.327	1.374	
DCP 10	0.100	0.581	0.674	0.753	0.780	0.823	0.936	0.972	1.025	1.076	1.112	1.108	
DCP 11	0.110	0.513	0.583	0.632	0.660	0.722	0.764	0.810	0.834	0.875	0.943	0.930	
DCP 12	0.120	0.361	0.437	0.488	0.501	0.579	0.570	0.603	0.635	0.627	0.665	0.705	
DCP 13	0.130	0.317	0.377	0.399	0.433	0.472	0.492	0.465	0.531	0.515	0.545	0.532	
DCP 14	0.140	0.337	0.365	0.338	0.404	0.394	0.419	0.372	0.424	0.444	0.435	0.427	
DCP 15	0.150	0.235	0.205	0.208	0.242	0.240	0.246	0.225	0.197	0.243	0.202	0.184	
DCP 16	0.160	-0.083	-0.057	-0.062	-0.066	-0.054	-0.067	-0.055	-0.058	-0.056	-0.052	-0.035	
DCP 17	0.169	-0.042	-0.038	-0.095	-0.037	-0.046	-0.047	-0.061	-0.073	-0.105	-0.085	-0.059	

DATA TYPE	X/C	8.891	9.426	9.917	10.446	10.957	11.511	12.008	12.543	13.067	13.598	14.061	
ALPHA:													
CN		1.063	1.057	1.004	1.015	1.006	0.998	0.961	0.961	0.928	0.933	0.942	
CM		0.018	0.018	-0.005	-0.014	-0.046	-0.052	-0.063	-0.062	-0.080	-0.076	-0.081	
DCP 1	0.010	6.352	6.057	4.955	4.974	4.414	4.241	4.244	2.144	2.012	2.053	2.075	
DCP 2	0.020	5.856	5.704	4.163	4.051	3.485	3.404	1.833	1.770	1.702	1.639	1.626	
DCP 3	0.030	4.530	4.723	3.867	3.995	3.714	3.598	1.862	1.812	1.765	1.816	1.732	
DCP 4	0.040	3.451	3.451	2.868	2.757	2.459	2.411	2.935	2.895	2.725	2.605	2.709	
DCP 5	0.050	3.009	2.930	2.425	2.250	2.010	1.952	2.560	2.501	2.614	2.576	2.612	
DCP 6	0.060	2.692	2.736	2.255	2.214	1.812	1.762	2.242	2.242	2.332	2.510	2.467	
DCP 7	0.070	1.972	1.765	1.765	1.854	1.568	1.572	1.422	1.439	1.405	1.453	1.587	
DCP 8	0.080	1.713	1.707	1.713	1.747	1.411	1.514	1.339	1.255	1.146	1.220	1.120	
DCP 9	0.090	1.371	1.371	1.440	1.465	1.411	1.374	1.108	1.121	1.051	1.013	1.023	
DCP 10	0.100	1.162	1.117	1.240	1.310	1.259	1.172	1.031	1.040	0.974	0.977	0.926	
DCP 11	0.110	0.952	0.935	1.050	1.068	1.202	1.265	1.034	1.009	0.908	0.937	0.915	
DCP 12	0.120	0.709	0.707	0.811	0.678	0.864	0.942	0.918	0.869	0.746	0.805	0.810	
DCP 13	0.130	0.572	0.548	0.534	0.625	0.733	0.688	0.836	0.750	0.762	0.763	0.800	
DCP 14	0.140	0.424	0.368	0.421	0.361	0.479	0.502	0.723	0.717	0.597	0.598	0.705	
DCP 15	0.150	0.230	0.232	0.237	0.316	0.366	0.375	0.565	0.556	0.597	0.598	0.615	
DCP 16	0.160	-0.045	-0.050	-0.050	0.076	0.107	0.150	0.183	0.244	0.184	0.193	0.233	
DCP 17	0.169	-0.075	-0.060	-0.043	-0.012	0.010	0.001	0.015	0.034	0.004	0.002	0.000	

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.400 Rn = 2.3 x 10⁶ SOLID FLOOR AND CEILING

DATA TYPE	X/C	14.642	15.137	15.494	16.116	16.709
ALPHA						
CN		0.481	0.958	0.987	0.978	0.583
CM		-0.086	-0.085	-0.084	-0.087	-0.091
DCP 1	.010	2.025	2.005	1.542	1.683	1.720
DCP 2	.020	1.722	1.662	1.702	1.704	1.770
DCP 3	.030	1.762	1.807	1.661	1.760	1.683
DCP 4	.040	2.647	2.476	2.577	2.652	2.466
DCP 5	.074	2.522	2.472	2.513	2.566	2.678
DCP 6	.095	2.615	2.575	2.617	2.649	2.547
DCP 7	.145	1.572	1.616	1.707	1.589	1.708
DCP 8	.200	1.286	1.184	1.244	1.162	1.156
DCP 9	.250	1.116	1.066	1.098	1.142	1.176
DCP 10	.300	1.036	0.974	1.044	1.137	1.163
DCP 11	.355	1.001	0.948	1.007	1.021	1.024
DCP 12	.501	0.820	0.862	0.893	0.857	0.863
DCP 13	.600	0.802	0.768	0.745	0.770	0.782
DCP 14	.701	0.754	0.737	0.750	0.724	0.756
DCP 15	.800	0.610	0.637	0.647	0.597	0.611
DCP 16	.900	0.246	0.226	0.305	0.262	0.268
DCP 17	.965	0.017	-0.005	0.140	0.060	0.059

M = 0.399 Re = 4.7 x 10⁶

SOLID FLOOR AND CEILING

ALPHA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CN	-9.581	-9.015	-8.378	-7.817	-7.257	-6.652	-6.015	-5.455	-4.836	-4.258	-3.598						
CM	-0.628	-0.605	-0.596	-0.535	-0.495	-0.486	-0.444	-0.414	-0.356	-0.303	-0.238						
	-0.013	-0.023	-0.037	-0.042	-0.039	-0.033	-0.036	-0.025	-0.025	-0.023	-0.021						
DCP 1	-3.087	-3.234	-3.125	-2.635	-3.142	-4.793	-4.578	-4.816	-4.414	-3.547	-3.305						
DCP 2	-2.475	-2.410	-2.714	-2.616	-3.244	-3.545	-3.212	-2.977	-2.616	-2.438	-2.135						
DCP 3	-2.148	-2.155	-2.213	-3.150	-3.157	-3.071	-2.578	-2.606	-2.099	-1.664	-1.603						
DCP 4	-1.734	-1.866	-2.257	-2.452	-2.325	-2.035	-1.923	-1.676	-1.482	-1.282	-1.114						
DCP 5	-1.652	-1.787	-2.039	-2.198	-1.874	-1.461	-1.385	-1.204	-1.042	-0.845	-0.682						
DCP 6	-1.455	-1.575	-1.815	-1.668	-1.411	-1.169	-1.065	-0.952	-0.840	-0.685	-0.524						
DCP 7	-1.317	-1.403	-1.501	-1.265	-1.032	-0.791	-0.674	-0.585	-0.510	-0.415	-0.307						
DCP 8	-1.227	-1.241	-1.312	-0.902	-0.731	-0.675	-0.541	-0.520	-0.441	-0.351	-0.272						
DCP 9	-1.141	-1.194	-0.586	-0.807	-0.640	-0.606	-0.442	-0.400	-0.325	-0.292	-0.197						
DCP 10	-1.032	-0.877	-0.724	-0.578	-0.466	-0.480	-0.319	-0.311	-0.230	-0.227	-0.155						
DCP 11	-0.663	-0.520	-0.487	-0.349	-0.351	-0.363	-0.257	-0.233	-0.201	-0.167	-0.115						
DCP 12	-0.403	-0.371	-0.291	-0.234	-0.282	-0.287	-0.124	-0.121	-0.107	-0.090	-0.052						
DCP 13	-0.255	-0.197	-0.116	-0.117	-0.138	-0.161	-0.032	0.014	0.004	0.015	0.065						
DCP 14	-0.055	-0.036	0.003	0.005	0.002	0.001	0.048	-0.016	-0.004	-0.015	0.023						
DCP 15	-0.015	-0.001	0.015	-0.005	0.022	-0.001	-0.052	-0.066	-0.004	-0.015	0.023						
DCP 16	-0.032	-0.035	-0.033	-0.037	-0.052	-0.072	-0.076	-0.066	-0.039	-0.081	-0.105						
DCP 17	-0.054	-0.035	-0.033	-0.015	0.010	-0.008	0.010	-0.025	-0.036	-0.029	-0.035						
ALPHA	-3.020	-2.253	-1.810	-1.315	-0.865	-0.446	0.329	0.727	1.086	1.455	1.927						
CN	-0.176	-0.116	-0.052	-0.004	0.075	0.125	0.263	0.326	0.387	0.455	0.515						
CM	-0.018	-0.019	-0.016	-0.014	-0.015	-0.012	-0.014	-0.012	-0.011	-0.011	-0.008						
DCP 1	-2.732	-2.253	-1.810	-1.315	-0.865	-0.446	0.329	0.727	1.086	1.455	1.927						
DCP 2	-1.821	-1.512	-1.177	-0.896	-0.574	-0.227	0.361	0.711	1.052	1.358	1.655						
DCP 3	-1.310	-0.824	-0.468	-0.501	-0.275	-0.059	0.512	0.764	1.043	1.338	1.600						
DCP 4	-0.875	-0.677	-0.468	-0.227	-0.036	0.165	0.650	0.873	1.093	1.314	1.580						
DCP 5	-0.520	-0.346	-0.169	0.01	0.183	0.345	0.718	0.890	1.085	1.276	1.447						
DCP 6	-0.362	-0.241	-0.072	0.068	0.235	0.346	0.657	0.816	0.974	1.139	1.224						
DCP 7	-0.282	-0.158	-0.050	0.068	0.186	0.298	0.514	0.660	0.756	0.855	0.977						
DCP 8	-0.246	-0.166	-0.044	0.048	0.133	0.253	0.426	0.504	0.617	0.731	0.814						
DCP 9	-0.184	-0.120	-0.020	0.054	0.126	0.194	0.345	0.466	0.535	0.624	0.697						
DCP 10	-0.155	-0.071	-0.016	0.068	0.133	0.194	0.340	0.408	0.465	0.556	0.615						
DCP 11	-0.072	-0.065	0.025	0.068	0.115	0.165	0.274	0.346	0.413	0.449	0.506						
DCP 12	-0.080	-0.038	-0.003	0.033	0.095	0.117	0.222	0.264	0.295	0.351	0.377						
DCP 13	-0.016	0.025	0.047	0.066	0.096	0.125	0.217	0.261	0.266	0.311	0.334						
DCP 14	0.080	0.110	0.133	0.161	0.178	0.190	0.255	0.265	0.307	0.320	0.336						
DCP 15	0.032	0.045	0.050	0.062	0.086	0.106	0.122	0.138	0.124	0.174	0.172						
DCP 16	-0.109	-0.101	-0.113	-0.111	-0.084	-0.106	-0.086	-0.073	-0.072	-0.074	-0.043						
DCP 17	-0.059	-0.034	-0.040	-0.052	-0.052	-0.061	-0.045	-0.045	-0.045	-0.065	-0.065						

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.399 Re = 4.7 x 10⁶

ALPHA	4.233	4.892	5.471	6.070	6.652	7.302	7.847	8.458	9.065	9.675	10.266
CN	0.582	3.650	0.700	0.756	0.823	0.879	0.937	0.984	1.039	1.094	1.149
CM	-0.006	-0.008	-0.006	-0.001	-0.003	-0.001	0.002	0.005	0.005	0.015	0.020
DCP 1	0.010	2.357	2.718	3.528	3.534	4.378	5.055	5.645	6.071	6.222	6.346
DCP 2	0.020	1.053	2.362	2.998	3.152	3.496	3.719	3.837	4.263	5.098	5.585
DCP 3	0.030	1.908	2.190	2.696	2.937	3.239	3.482	3.696	3.843	4.001	4.336
DCP 4	0.049	1.821	2.023	2.501	2.726	2.910	3.163	3.362	3.473	3.566	3.652
DCP 5	0.074	1.646	1.847	2.039	2.293	2.557	2.701	2.858	3.024	3.080	3.122
DCP 6	0.099	1.454	1.626	1.911	2.052	2.206	2.356	2.457	2.585	2.657	2.688
DCP 7	0.149	1.126	1.250	1.475	1.584	1.670	1.774	1.890	1.982	2.027	2.110
DCP 8	0.203	0.904	1.004	1.156	1.279	1.364	1.440	1.528	1.608	1.622	1.656
DCP 9	0.250	0.775	0.832	1.012	1.080	1.153	1.245	1.300	1.381	1.407	1.441
DCP 10	0.300	0.683	0.753	0.868	0.925	0.995	1.054	1.115	1.166	1.182	1.201
DCP 11	0.399	0.591	0.631	0.764	0.812	0.812	0.876	0.877	0.943	0.971	0.965
DCP 12	0.501	0.435	0.466	0.543	0.592	0.623	0.637	0.700	0.753	0.706	0.734
DCP 13	0.600	0.355	0.430	0.426	0.502	0.516	0.562	0.554	0.560	0.566	0.561
DCP 14	0.701	0.340	0.385	0.414	0.439	0.466	0.466	0.464	0.483	0.445	0.415
DCP 15	0.800	0.190	0.210	0.203	0.220	0.220	0.216	0.235	0.245	0.213	0.185
DCP 16	0.900	-0.055	-0.055	-0.055	-0.046	-0.037	-0.036	-0.023	-0.026	-0.036	-0.032
DCP 17	0.969	-0.074	-0.075	-0.062	-0.068	-0.066	-0.065	-0.080	-0.067	-0.075	-0.059

ALPHA	10.855	11.524	12.044	12.631	13.228	13.881	14.427	15.100	15.651	16.915	17.468
CN	1.074	1.037	1.057	1.054	1.038	1.056	1.029	1.012	1.052	1.101	1.099
CM	0.024	0.008	-0.008	-0.024	-0.040	-0.053	-0.045	-0.055	-0.061	-0.085	-0.087
DCP 1	0.010	6.130	3.573	2.812	2.724	2.448	2.525	2.573	2.607	4.127	4.384
DCP 2	0.020	5.637	3.254	2.880	2.760	2.416	2.502	2.605	2.697	3.222	2.911
DCP 3	0.030	4.734	3.627	3.333	3.057	2.825	3.025	3.128	3.106	2.132	1.711
DCP 4	0.049	3.754	3.708	3.455	3.140	3.094	2.854	2.613	2.711	2.644	2.559
DCP 5	0.074	3.126	3.042	2.920	2.710	2.641	2.515	2.295	2.444	2.476	2.534
DCP 6	0.099	2.635	2.657	2.491	2.280	2.382	2.258	2.110	2.346	2.165	2.331
DCP 7	0.149	2.087	1.592	1.924	1.831	1.793	1.842	1.722	1.915	1.864	1.933
DCP 8	0.200	1.703	1.767	1.664	1.618	1.534	1.561	1.566	1.571	1.564	1.632
DCP 9	0.250	1.471	1.530	1.595	1.575	1.600	1.543	1.564	1.466	1.391	1.315
DCP 10	0.300	1.217	1.258	1.428	1.427	1.383	1.374	1.363	1.344	1.245	1.167
DCP 11	0.399	0.976	1.064	1.136	1.122	1.164	1.107	1.095	1.116	1.172	1.127
DCP 12	0.501	0.706	0.745	0.791	0.852	0.868	0.802	0.868	0.881	0.871	0.880
DCP 13	0.600	0.503	0.582	0.663	0.595	0.726	0.684	0.708	0.715	0.747	0.782
DCP 14	0.701	0.385	0.402	0.473	0.531	0.539	0.555	0.545	0.586	0.570	0.584
DCP 15	0.800	0.192	0.243	0.266	0.255	0.365	0.346	0.365	0.435	0.370	0.354
DCP 16	0.900	-0.021	0.036	0.040	0.120	0.140	0.140	0.163	0.235	0.235	0.246
DCP 17	0.969	-0.064	0.016	-0.022	0.004	0.011	0.014	0.040	0.065	0.035	0.053

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.399 Re = 4.7×10^6 SOLID FLOOR AND CEILING

ALPHA	18.344	18.647	19.219	19.863
CN	1.075	1.058	1.045	1.032
CM	-0.087	-0.087	-0.088	-0.092
DCP 1	.010	3.834	3.645	3.215
DCP 2	.020	2.906	2.776	2.679
DCP 3	.030	1.660	1.706	1.695
DCP 4	.049	2.470	2.445	2.281
DCP 5	.074	2.442	2.208	2.244
DCP 6	.099	2.193	2.160	2.128
DCP 7	.149	2.057	1.981	1.923
DCP 8	.200	1.686	1.617	1.555
DCP 9	.250	1.243	1.237	1.265
DCP 10	.300	1.108	1.137	1.082
DCP 11	.399	1.032	1.024	1.059
DCP 12	.501	0.942	0.917	0.904
DCP 13	.600	0.832	0.806	0.831
DCP 14	.701	0.802	0.773	0.761
DCP 15	.800	0.657	0.608	0.589
DCP 16	.900	0.214	0.274	0.294
DCP 17	.969	0.054	0.079	0.060

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

$$M = 0.400 \quad R_n = 6.3 \times 10^6$$

SOLID FLOOR AND CEILING

	ALPHA	-9.588 -0.661 -0.018	-8.486 -0.615 -0.036	-7.561 -0.547 -0.039	-7.241 -0.526 -0.038	-6.700 -0.500 -0.036	-6.094 -0.470 -0.034	-5.440 -0.435 -0.023	-4.878 -0.384 -0.025	-4.29C -0.323 -0.023	-3.665 -0.268 -0.019
DGP 1	.010	-2.006	-2.247	-2.696	-3.038	-3.712	-5.153	-5.191	-4.784	-4.165	-3.545
DGP 2	.020	-1.886	-2.130	-2.848	-3.475	-3.712	-3.447	-3.041	-2.844	-2.583	-2.305
DGP 3	.030	-3.220	-3.19C	-3.338	-3.243	-3.200	-3.071	-2.613	-2.148	-1.924	-1.685
DGP 4	.049	-2.200	-2.222	-2.325	-2.250	-2.050	-1.912	-1.746	-1.572	-1.352	-1.162
DGP 5	.074	-1.947	-2.276	-2.072	-1.715	-1.515	-1.311	-1.242	-1.100	-0.918	-0.739
DGP 6	.099	-1.807	-1.875	-1.578	-1.355	-1.179	-1.100	-0.562	-0.824	-0.705	-0.559
DGP 7	.149	-1.569	-1.356	-1.128	-1.092	-0.911	-0.840	-0.753	-0.691	-0.547	-0.437
DGP 8	.230	-1.169	-1.025	-0.944	-0.796	-0.779	-0.707	-0.631	-0.586	-0.466	-0.374
DGP 9	.250	-1.193	-1.100	-0.815	-0.742	-0.637	-0.582	-0.521	-0.464	-0.374	-0.303
DGPI0	.300	-1.030	-0.923	-0.617	-0.538	-0.499	-0.456	-0.434	-0.358	-0.311	-0.243
DGPI1	.399	-0.760	-0.499	-0.514	-0.371	-0.359	-0.361	-0.332	-0.291	-0.231	-0.199
DGPI2	.501	-0.475	-0.316	-0.292	-0.311	-0.297	-0.279	-0.255	-0.210	-0.186	-0.147
DGPI3	.600	-0.236	-0.143	-0.145	-0.137	-0.149	-0.130	-0.130	-0.103	-0.079	-0.057
DGPI4	.701	-0.035	-0.01C	-0.013	-0.005	-0.009	-0.020	-0.006	-0.024	-0.038	-0.054
DGPI5	.800	-0.038	-0.002	-0.023	-0.002	-0.008	-0.001	-0.012	-0.017	-0.030	-0.012
DGPI6	.900	-0.023	-0.049	-0.046	-0.004	-0.008	-0.072	-0.114	-0.109	-0.105	-0.123
DGPI7	.969	-0.016	0.016	-0.002	0.004	-0.008	-0.022	-0.03C	-0.019	-0.019	-0.060

ALPHA	-3.046	-2.492	-1.882	-1.198	-0.666	-0.065	0.583	1.181	1.767	2.388	2.998
CN	-0.203	-0.142	-0.073	-0.011	-0.052	0.115	0.186	0.250	0.316	0.371	0.437
CM	-0.018	-0.016	-0.016	-0.018	-0.014	-0.013	-0.016	-0.014	-0.013	-0.010	-0.010
DCP 1	-2.928	-2.411	-1.930	-1.483	-0.998	-0.575	-0.186	0.229	0.641	1.018	1.432
DCP 2	-2.010	-1.679	-1.330	-1.021	-0.693	-0.347	-0.032	0.264	0.639	0.946	1.255
DCP 3	-1.428	-1.167	-0.89C	-0.630	-0.362	-0.115	0.181	0.467	0.720	1.012	1.271
DCP 4	-0.921	-0.713	-0.515	-0.309	-0.055	0.158	0.356	0.584	0.839	1.023	1.290
DCP 5	-0.575	-0.403	-0.215	-0.035	-0.135	0.322	0.512	0.701	0.869	1.053	1.234
DCP 6	-0.401	-0.248	-0.094	0.047	0.206	0.336	0.508	0.692	0.805	0.981	1.142
DCP 7	-0.325	-0.204	-0.077	0.010	0.146	0.258	0.371	0.481	0.631	0.727	0.830
DCP 8	-0.285	-0.192	-0.089	0.028	0.089	0.194	0.276	0.371	0.479	0.553	0.679
DCP 9	-0.219	-0.155	-0.063	-0.011	0.091	0.170	0.249	0.351	0.433	0.497	0.574
DCP10	-0.165	-0.098	-0.043	-0.058	0.106	0.176	0.251	0.333	0.399	0.481	0.542
DCP11	-0.134	-0.072	-0.004	0.040	0.084	0.146	0.222	0.302	0.344	0.394	0.425
DCP12	-0.105	-0.095	-0.015	0.026	0.067	0.126	0.165	0.193	0.245	0.273	0.341
DCP13	-0.023	0.006	0.031	0.071	0.095	0.144	0.168	0.218	0.250	0.274	0.292
DCP14	0.091	0.104	0.136	0.152	0.172	0.194	0.244	0.245	0.268	0.290	0.318
DCP15	0.016	0.033	0.037	0.068	0.077	0.089	0.112	0.131	0.144	0.129	0.165
CCP16	-0.003	-0.118	-0.115	-0.092	-0.098	-0.120	-0.093	-0.082	-0.063	-0.088	-0.071
CCP17	-0.037	-0.032	-0.041	-0.029	-0.045	-0.037	-0.040	-0.047	-0.068	-0.060	-0.050

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.400 Re = 6.3 x 10⁶

SOLID FLOOR AND CEILING

ALPHA CN	3.563 0.500 -0.008	4.166 0.576 -0.010	4.834 0.643 -0.010	5.368 0.694 -0.007	6.013 0.763 -0.006	6.590 0.831 -0.005	7.225 0.887 -0.001	7.812 0.944 0.000	8.398 1.000 0.002	9.026 1.033 0.006	9.601 1.063 0.011
DCP 1	-0.10	1.846	2.262	3.063	3.470	3.912	4.492	5.103	5.780	6.216	6.439
DCP 2	-0.20	1.593	1.958	2.566	2.915	3.277	3.568	3.871	4.106	4.187	4.817
DCP 3	-0.30	1.573	1.864	2.422	2.672	2.986	3.283	3.510	3.736	3.905	4.014
DCP 4	-0.49	1.538	1.759	2.231	2.493	2.727	2.951	3.172	3.359	3.501	3.600
DCP 5	-0.74	1.411	1.614	1.959	2.180	2.378	2.549	2.707	2.881	3.000	3.056
DCP 6	-0.99	1.309	1.446	1.632	1.911	2.087	2.225	2.345	2.518	2.591	2.667
DCP 7	-1.49	0.965	1.089	1.224	1.295	1.578	1.677	1.787	1.863	1.947	2.030
DCP 8	-2.00	0.760	0.868	0.963	1.152	1.265	1.350	1.407	1.526	1.574	1.617
DCP 9	-2.50	0.665	0.778	0.841	0.999	1.076	1.163	1.218	1.292	1.365	1.418
DCP 10	-3.00	0.596	0.670	0.752	0.890	0.944	1.024	1.078	1.120	1.179	1.199
DCP 11	-3.99	0.504	0.565	0.597	0.718	0.776	0.811	0.874	0.907	0.938	0.955
DCP 12	-5.00	0.346	0.446	0.483	0.556	0.602	0.623	0.645	0.705	0.701	0.731
DCP 13	-6.00	0.236	0.364	0.41	0.42	0.490	0.528	0.556	0.558	0.574	0.595
DCP 14	-7.00	0.132	0.359	0.41	0.40	0.451	0.460	0.452	0.498	0.487	0.479
DCP 15	-8.00	0.077	0.317	0.379	0.36	0.429	0.250	0.263	0.262	0.246	0.236
DCP 16	-9.00	-0.073	-0.065	-0.049	-0.01	-0.022	-0.064	-0.062	-0.031	-0.010	-0.058
DCP 17	-9.69	-0.070	-0.050	-0.040	-0.01	-0.071	-0.060	-0.071	-0.050	-0.077	-0.065
ALPHA CN	10.191 1.091 0.016	10.837 1.092 0.023	11.608 1.081 0.026	11.597 1.075 0.022	11.602 1.035 0.014	13.271 1.020 -0.005	13.778 1.012 -0.028	14.417 1.037 -0.036	15.048 1.035 -0.049	15.563 1.023 -0.055	16.154 1.040 -0.061
DCP 1	-0.10	6.498	6.339	6.184	5.952	4.741	4.863	4.670	4.655	4.120	4.211
DCP 2	-0.20	5.512	5.713	5.570	5.280	4.469	4.126	4.044	4.097	3.452	3.597
DCP 3	-0.30	4.338	4.788	4.796	4.562	4.235	3.943	3.660	3.357	3.128	3.228
DCP 4	-0.49	3.669	3.840	3.563	3.958	3.677	3.230	3.361	3.148	3.095	2.920
DCP 5	-0.74	3.139	3.140	3.146	3.125	2.795	2.487	2.527	2.521	2.383	2.211
DCP 6	-0.99	2.740	2.737	2.741	2.695	2.334	2.079	2.178	2.107	2.126	2.037
DCP 7	-1.49	2.073	2.108	2.082	2.105	1.775	1.698	1.736	1.704	1.714	1.717
DCP 8	-2.00	1.673	1.695	1.683	1.721	1.521	1.460	1.534	1.442	1.452	1.487
DCP 9	-2.50	1.424	1.430	1.415	1.386	1.309	1.328	1.382	1.257	1.276	1.396
DCP 10	-3.00	1.263	1.248	1.215	1.213	1.185	1.222	1.199	1.154	1.141	1.192
DCP 11	-3.99	0.957	0.982	0.951	0.936	0.936	1.015	0.977	1.015	1.026	1.011
DCP 12	-5.01	0.738	0.720	0.711	0.685	0.731	0.738	0.797	0.791	0.843	0.906
DCP 13	-6.00	0.575	0.545	0.525	0.495	0.557	0.626	0.666	0.765	0.732	0.760
DCP 14	-7.01	0.440	0.426	0.355	0.354	0.476	0.495	0.543	0.607	0.585	0.628
DCP 15	-8.00	0.214	0.195	0.198	0.191	0.287	0.344	0.376	0.442	0.472	0.519
DCP 16	-9.00	-0.022	-0.053	-0.022	0.042	0.047	0.166	0.172	0.176	0.190	0.161
DCP 17	-9.69	-0.046	-0.057	-0.037	-0.019	-0.023	0.017	0.070	0.055	0.055	0.043

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.400 Rn = 6.3×10^6

ALPHA	16.758	17.395	17.568	18.578	19.211	19.757
CN	1.022	1.033	1.007	0.574	1.018	1.003
CM	-0.065	-0.075	-0.07C	-0.081	-0.095	-0.092
DCP 1	3.689	3.702	3.516	3.499	3.505	3.523
DCP 2	3.414	3.309	3.258	3.08C	2.571	2.816
DCP 3	3.055	2.632	2.655	2.77C	2.470	2.225
DCP 4	2.637	2.512	2.395	2.096	2.059	2.140
DCP 5	2.120	2.225	1.570	1.750	1.815	1.849
DCP 6	2.018	1.961	1.860	1.638	1.714	1.793
DCP 7	1.664	1.668	1.764	1.495	1.564	1.628
DCP 8	1.489	1.506	1.448	1.349	1.449	1.477
DCP 9	1.372	1.394	1.384	1.322	1.306	1.311
DCP10	1.224	1.234	1.242	1.183	1.247	1.145
DCP11	1.077	1.101	1.050	1.10C	1.150	1.054
DCP12	0.902	0.928	0.672	0.931	0.980	0.857
DCP13	0.704	0.747	0.784	0.780	0.868	0.748
DCP14	0.639	0.65C	0.634	0.626	0.711	0.569
DCP15	0.477	0.504	0.47C	0.517	0.553	0.531
DCP16	0.203	0.248	0.216	0.226	0.257	0.231
DCP17	0.064	0.082	0.045	0.068	0.076	0.072

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.401 Rn = 7.0 x 10⁶

ALPHA CM	3.724 0.524 -0.013	4.345 0.578 -0.009	5.566 0.701 -0.007	6.117 0.761 -0.004	6.785 0.825 -0.005	7.400 0.878 0.090	7.563 0.941 0.000	8.562 0.994 0.004	9.191 1.036 0.006	9.747 1.056 0.011
DCP 1	-0.010	1.952	2.308	3.512	3.966	4.475	5.232	5.880	6.311	6.454
DCP 2	-0.020	1.443	1.572	2.990	3.296	3.551	3.870	3.983	4.128	4.752
DCP 3	-0.030	1.903	2.408	2.684	3.004	3.261	3.524	3.733	3.925	4.012
DCP 4	-0.049	1.567	1.795	2.476	2.717	2.942	3.156	3.348	3.498	3.554
DCP 5	-0.074	1.454	1.622	2.193	2.383	2.541	2.692	2.875	2.999	3.050
DCP 6	-0.099	1.339	1.475	1.939	2.102	2.235	2.371	2.488	2.608	2.690
DCP 7	-0.149	0.566	1.089	1.439	1.537	1.632	1.764	1.866	1.938	1.977
DCP 8	-0.200	0.791	0.894	1.157	1.243	1.342	1.404	1.505	1.595	1.619
DCP 9	-0.250	0.696	0.757	0.993	1.098	1.135	1.223	1.296	1.362	1.391
DCP 10	-0.300	0.637	0.684	0.881	0.940	1.011	1.065	1.114	1.157	1.198
DCP 11	-0.399	0.497	0.545	0.712	0.757	0.804	0.852	0.912	0.938	0.974
DCP 12	-0.501	0.383	0.408	0.546	0.599	0.613	0.643	0.685	0.721	0.703
DCP 13	-0.600	0.361	0.389	0.421	0.492	0.528	0.541	0.568	0.570	0.571
DCP 14	-0.701	0.354	0.356	0.419	0.448	0.431	0.467	0.484	0.483	0.468
DCP 15	-0.800	0.189	0.207	0.234	0.245	0.245	0.262	0.256	0.249	0.258
DCP 16	-0.900	0.037	-0.046	-0.055	-0.033	-0.041	-0.015	-0.038	-0.006	-0.046
DCP 17	-0.969	-0.058	-0.076	-0.074	-0.055	-0.073	-0.068	-0.065	-0.078	-0.078

ALPHA CM	10.391 1.067 0.018	10.598 1.074 0.021	12.183 1.030 0.027	12.724 1.016 0.010	13.441 0.962 -0.025	13.994 0.577 -0.030	14.575 1.028 -0.049	15.174 0.999 -0.048	15.840 0.958 -0.056	16.344 0.964 -0.056
DCP 1	-0.010	6.473	6.236	5.255	4.840	5.040	4.945	4.872	4.211	4.411
DCP 2	-0.020	5.358	5.585	4.983	4.072	4.180	3.858	3.972	3.621	3.674
DCP 3	-0.030	4.256	4.688	4.653	4.066	3.832	3.242	3.331	3.379	3.307
DCP 4	-0.049	3.615	3.773	3.855	3.017	3.126	3.187	2.819	2.296	2.409
DCP 5	-0.074	3.103	3.110	2.883	2.381	2.421	2.655	2.287	1.981	1.917
DCP 6	-0.099	2.690	2.703	2.459	1.927	1.995	2.142	1.579	1.732	1.758
DCP 7	-0.149	2.033	2.055	1.906	1.522	1.547	1.654	1.637	1.458	1.521
DCP 8	-0.200	1.653	1.672	1.592	1.345	1.405	1.337	1.411	1.428	1.373
DCP 9	-0.250	1.434	1.421	1.328	1.274	1.245	1.215	1.321	1.282	1.271
DCP 10	-0.300	1.198	1.232	1.154	1.165	1.077	1.137	1.098	1.149	1.175
DCP 11	-0.399	0.566	0.952	0.901	0.927	0.951	1.017	0.992	0.992	1.026
DCP 12	-0.501	0.726	0.737	0.656	0.768	0.731	0.823	0.787	0.835	0.820
DCP 13	-0.600	0.557	0.543	0.472	0.572	0.622	0.655	0.686	0.670	0.655
DCP 14	-0.701	0.431	0.420	0.373	0.494	0.532	0.580	0.585	0.626	0.567
DCP 15	-0.800	0.207	0.196	0.255	0.334	0.337	0.472	0.455	0.410	0.439
DCP 16	-0.900	-0.041	-0.030	0.074	0.140	0.159	0.207	0.162	0.179	0.191
DCP 17	-0.969	-0.070	-0.075	-0.008	-0.021	-0.034	0.047	0.045	0.022	0.049

AIRFOIL NLR 7233-62 STEADY FORCES AND MOMENTS

M = 0.401 Re = 7.0 x 10⁶ SOLID FLOOR AND CEILING

ALPHA	17.010	17.585	18.177	18.756	19.325
CN	0.985	0.980	0.962	0.977	0.931
CM	-0.062	-0.069	-0.074	-0.083	-0.083
DCP 1	-0.010	3.488	3.447	3.268	3.121
DCP 2	-0.020	3.429	2.997	2.871	2.696
DCP 3	-0.030	3.099	2.784	2.468	2.582
DCP 4	-0.049	2.403	2.157	2.236	1.842
DCP 5	-0.074	1.997	1.916	1.846	1.657
DCP 6	-0.099	1.910	1.711	1.825	1.576
DCP 7	-0.149	1.544	1.509	1.502	1.421
DCP 8	-0.200	1.395	1.405	1.363	1.304
DCP 9	-0.250	1.382	1.307	1.242	1.223
DCP 10	-0.300	1.120	1.201	1.149	1.177
DCP 11	-0.399	1.067	1.028	1.120	1.047
DCP 12	-0.501	0.859	0.866	0.912	0.515
DCP 13	-0.600	0.680	0.701	0.805	0.774
DCP 14	-0.701	0.579	0.633	0.665	0.636
DCP 15	-0.800	0.444	0.469	0.510	0.484
DCP 16	-0.900	0.233	0.227	0.218	0.217
DCP 17	-0.969	0.039	0.048	0.072	0.064

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.500 Re = 7.9 x 10⁶

ALPHA CN CM	DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	-5.525 -0.676 -0.008	-9.001 -0.648 -0.022	-6.421 -0.616 -0.036	-7.811 -3.565 -3.042	-7.252 -0.526 -3.044	-6.656 -0.491 -0.042	-6.024 -3.462 -0.039	-5.435 -0.409 -0.032	-4.858 -3.368 -0.025	-4.274 -0.318 -3.024	-3.558 -3.259 -0.021
DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	-2.275 -2.150 -2.668 -2.104 -1.834 -1.800 -1.494 -1.137 -1.123 -0.552 -0.727 -0.455 -0.339 -0.090 -0.056 -0.077 -0.000	-2.351 -2.382 -2.896 -2.219 -1.913 -1.850 -1.489 -1.127 -1.176 -0.662 -0.591 -0.426 -0.192 -0.063 -0.056 -0.041 -0.010	-2.880 -2.626 -3.088 -2.477 -2.161 -1.729 -1.437 -1.301 -1.036 -0.688 -0.478 -0.339 -0.172 -0.009 -0.013 -0.051 -0.002	-2.937 -3.191 -2.119 -2.480 -2.106 -1.725 -1.267 -0.944 -0.899 -0.656 -0.429 -0.292 -0.144 -0.029 -0.016 -0.019 -0.026	-3.432 -3.334 -3.107 -2.476 -1.905 -1.557 -1.122 -0.940 -0.742 -0.546 -0.349 -0.274 -0.144 -0.036 -0.015 -0.035 -0.015	-3.882 -3.437 -3.038 -2.425 -1.766 -1.377 -0.940 -0.737 -0.654 -0.475 -0.346 -0.262 -0.138 -0.015 -0.041 -0.044 -0.006	-3.810 -3.270 -2.805 -2.288 -1.555 -1.122 -0.798 -0.695 -0.556 -0.433 -0.303 -0.236 -0.110 -0.029 -0.013 -0.033 -0.005	-3.797 -2.570 -2.622 -2.110 -1.399 -0.939 -0.724 -0.639 -0.517 -0.383 -0.279 -0.221 -0.127 -0.041 -0.010 -0.075 -0.018	-3.521 -2.939 -2.590 -1.850 -1.134 -0.842 -0.612 -0.544 -0.441 -0.343 -0.262 -0.195 -0.108 -0.041 -0.012 -0.081 -0.017	-3.855 -2.757 -2.057 -1.295 -0.875 -0.711 -0.526 -0.457 -0.385 -0.298 -0.216 -0.189 -0.077 -0.032 -0.004 -0.081 -0.033	-3.773 -2.171 -1.700 -1.131 -0.732 -0.551 -0.436 -0.368 -0.308 -0.208 -0.154 -0.143 -0.056 -0.065 -0.005 -0.122 -0.024

ALPHA CN CM	DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	-3.047 -3.198 -3.021	-2.452 -0.137 -3.017	-1.851 -0.070 -0.017	-1.162 -0.007 -0.016	-0.620 0.059 -0.016	0.010 0.128 -0.016	0.680 0.196 -0.015	1.186 0.282 -3.013	1.801 0.327 -0.010	2.458 0.401 -0.012	3.015 0.472 -3.010
DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	-3.198 -2.014 -1.463 -3.922 -0.552 -0.415 -0.277 -0.227 -0.142 -0.121 -0.081 -0.018 -0.080 0.021 -0.107 -0.037	-2.551 -1.686 -1.217 -0.656 -0.365 -0.263 -0.187 -0.194 -0.140 -0.076 -0.054 -0.060 -0.002 0.105 0.028 -0.042	-1.966 -1.371 -0.543 -0.485 -0.186 -0.095 -0.071 -0.082 -0.052 -0.004 -0.004 -0.001 -0.001 -0.133 0.050 -0.110 -0.049	-1.538 -1.050 -0.673 -0.265 -0.015 -0.048 -0.033 -0.001 -0.017 -0.061 -0.063 -0.031 -0.056 -0.162 -0.058 -0.052 -0.052	-1.072 -0.709 -0.425 -0.302 -0.164 -0.208 -0.162 -0.114 -0.101 -0.121 -0.118 -0.071 -0.095 -0.165 -0.073 -0.081 -0.040	-0.680 -0.363 -0.138 0.175 0.385 0.359 0.284 0.204 0.230 0.203 0.184 0.113 0.113 0.194 0.090 -0.078 -0.037	-0.276 -0.044 0.165 0.419 0.576 0.552 0.402 0.303 0.291 0.259 0.235 0.179 0.181 0.230 0.114 -0.052 -0.060	0.162 0.333 0.451 0.663 0.757 0.715 0.543 0.400 0.371 0.351 0.294 0.205 0.211 0.255 0.112 -0.091 -0.048	0.605 0.665 0.738 0.911 0.956 0.882 0.648 0.514 0.461 0.424 0.354 0.258 0.232 0.230 0.126 -0.077 -0.070	0.817 0.991 1.053 1.159 1.172 1.061 0.756 0.626 0.554 0.510 0.426 0.296 0.297 0.308 0.143 -0.076 -0.072	1.397 1.322 1.346 1.430 1.377 1.248 0.897 0.732 0.632 0.578 0.488 0.345 0.318 0.338 0.174 -0.087 -0.065

REPRODUCIBILITY OF THE
PAGE IS POOR

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.500 Re = 7.9 x 10 ⁶														
SOLID FLOOR AND CEILING														
ALPHA	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CN	3.624	4.265	4.861	5.428	6.048	6.661	7.251	7.832	8.523	9.054	9.685			
CM	3.542	0.610	0.671	3.734	0.795	0.862	3.927	0.773	1.005	1.037	1.086			
	-0.009	-0.007	-0.006	-0.002	-0.032	0.002	0.004	3.313	0.019	3.025	0.025			
DCP 1	0.110	2.285	2.592	3.103	3.613	4.350	4.850	4.891	5.018	5.135	4.903			
DCP 2	0.020	2.043	2.369	2.709	2.816	3.757	4.425	4.830	5.008	5.152	5.031			
DCP 3	0.030	1.562	2.268	2.570	2.805	2.830	4.106	4.457	4.732	4.888	4.507			
DCP 4	0.049	1.715	2.226	2.485	2.750	3.051	2.726	4.125	4.425	4.625	4.688			
DCP 5	0.074	1.586	1.994	2.181	2.385	2.585	2.720	2.454	2.868	3.417	3.218			
DCP 6	0.099	1.414	1.702	1.858	2.072	2.219	2.348	2.349	2.284	2.452	2.575			
DCP 7	0.149	1.040	1.274	1.405	1.516	1.620	1.727	1.787	1.826	1.830	1.912			
DCP 8	0.200	0.825	1.022	1.123	1.210	1.295	1.375	1.424	1.484	1.503	1.786			
DCP 9	0.250	0.621	0.874	0.965	1.044	1.122	1.195	1.233	1.285	1.305	1.622			
DCP 10	0.300	0.440	0.798	0.856	0.927	0.977	1.033	1.082	1.117	1.135	1.404			
DCP 11	0.350	0.268	0.645	0.704	0.761	0.812	0.855	0.878	0.858	0.910	1.155			
DCP 12	0.400	0.094	0.494	0.518	0.556	0.601	0.638	0.660	0.674	0.672	0.883			
DCP 13	0.450	0.031	0.401	0.437	0.481	0.490	0.525	0.534	0.534	0.534	0.489			
DCP 14	0.500	0.365	0.393	0.433	0.437	0.440	0.460	0.445	0.445	0.418	0.356			
DCP 15	0.550	0.176	0.201	0.204	0.220	0.220	0.246	0.224	0.197	0.194	0.165			
DCP 16	0.600	-0.065	-0.065	-0.057	-0.056	-0.051	-0.046	-0.055	-0.055	-0.044	0.036			
DCP 17	0.650	-0.064	-0.063	-0.073	-0.073	-0.072	-0.075	-0.074	-0.081	-0.075	-0.052			
ALPHA	10.272	10.886	11.445	12.043	12.681	13.258	13.830	14.465	15.112	15.624	16.230			
CN	1.073	1.033	3.585	3.576	0.548	0.545	0.585	3.548	3.577	0.992	0.577			
CM	0.014	3.313	-0.001	-0.039	-0.317	-0.032	-0.031	-0.038	-0.046	-0.055	-0.064			
DCP 1	0.010	4.662	4.452	4.332	4.241	4.124	4.025	3.885	3.551	3.405	3.731			
DCP 2	0.020	4.622	4.268	3.890	3.743	3.488	3.315	3.320	2.955	2.831	2.550			
DCP 3	0.030	4.845	4.552	3.707	3.747	3.360	3.218	3.120	2.941	2.815	2.668			
DCP 4	0.049	3.444	3.660	2.916	2.700	2.440	2.526	2.309	2.412	2.466	2.153			
DCP 5	0.074	2.795	2.483	2.497	2.128	2.072	2.120	1.951	2.078	2.143	1.979			
DCP 6	0.099	2.442	2.214	2.181	2.073	1.567	2.012	1.545	2.030	2.045	1.943			
DCP 7	0.149	1.891	1.812	1.866	1.723	1.711	1.775	1.721	1.769	1.730	1.675			
DCP 8	0.200	1.675	1.517	1.562	1.546	1.474	1.543	1.533	1.538	1.520	1.581			
DCP 9	0.250	1.564	1.477	1.415	1.387	1.335	1.434	1.421	1.437	1.407	1.363			
DCP 10	0.300	1.281	1.215	1.243	1.255	1.169	1.284	1.194	1.307	1.237	1.252			
DCP 11	0.350	1.046	1.014	1.058	0.954	0.864	1.068	1.048	1.045	1.065	1.084			
DCP 12	0.400	0.713	0.708	0.724	0.744	0.626	0.715	0.746	0.785	0.845	0.834			
DCP 13	0.450	0.453	0.465	0.491	0.572	0.627	0.617	0.637	0.676	0.713	0.707			
DCP 14	0.500	0.361	0.396	0.373	0.401	0.433	0.454	0.467	0.530	0.582	0.611			
DCP 15	0.550	0.187	0.240	0.237	0.264	0.324	0.318	0.308	0.383	0.412	0.437			
DCP 16	0.600	0.030	0.038	0.063	0.067	0.082	0.082	0.144	0.113	0.158	0.155			
DCP 17	0.650	-0.005	-0.026	0.021	-0.026	0.012	0.008	0.007	-0.004	-0.004	0.004			

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.500 $R_n = 7.9 \times 10^6$ SOLID FLOOR AND CEILING

ALPHA	16.910	17.450	18.013
CN	0.570	0.580	0.576
CM	-0.070	-0.077	-0.080
DCP 1	-0.010	3.411	2.837
DCP 2	-0.020	2.537	2.751
DCP 3	-0.030	2.721	2.778
DCP 4	-0.049	2.942	2.026
DCP 5	-0.074	1.562	1.724
DCP 6	-0.059	1.823	1.735
DCP 7	-0.149	1.613	1.581
DCP 8	-0.200	1.465	1.421
DCP 9	-0.250	1.232	1.431
DCP10	-0.300	1.217	1.205
DCP11	-0.399	1.117	1.127
DCP12	-0.501	0.878	0.927
DCP13	-0.600	0.741	0.827
DCP14	-0.701	0.587	0.635
DCP15	-0.800	0.462	0.448
DCP16	-0.900	0.195	0.203
DCP17	-0.969	0.001	0.050

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

SOLID FLOOR AND CEILING

0.012	-8.428	-7.926	-7.413	-6.906	-6.365	-5.870	-5.329	-4.862	-4.304	-3.775	-2.700
0.042	-0.642	-0.640	-0.617	-0.585	-0.563	-0.536	-0.498	-0.451	-0.394	-0.340	-0.251
0.013	0.008	0.008	-0.001	-0.013	-0.026	-0.034	-0.041	-0.044	-0.043	-0.032	-0.025
0.0	-2.372	2.448	-2.511	-2.528	-2.541	-2.599	-2.599	-2.588	-2.641	-2.796	-2.922
0.20	-2.329	-2.391	-2.410	-2.349	-2.415	-2.443	-2.448	-2.471	-2.528	-2.656	-2.555
0.30	-2.658	-2.715	-2.718	-2.687	-2.673	-2.633	-2.619	-2.595	-2.423	-2.369	-1.862
0.40	-1.577	-1.578	-1.587	-1.612	-1.755	-1.812	-1.846	-1.846	-1.960	-1.858	-0.950
0.74	-1.426	-1.408	-1.410	-1.426	-1.562	-1.648	-1.642	-1.435	-1.649	-1.376	-0.580
0.99	-1.291	-1.294	-1.293	-1.322	-1.457	-1.450	-1.453	-1.483	-1.309	-0.910	-0.410
1.145	-1.243	-1.271	-1.264	-1.289	-1.325	-1.325	-1.325	-1.273	-0.964	-0.646	-0.369
2.200	-1.110	-1.149	-1.156	-1.128	-1.159	-1.125	-1.138	-0.953	-0.610	-0.443	-0.264
2.50	-1.086	-1.110	-1.083	-1.082	-1.060	-1.004	-0.958	-0.593	-0.417	-0.305	-0.249
3.00	-0.899	-0.920	-0.897	-0.878	-0.792	-0.737	-0.589	-0.491	-0.363	-0.312	-0.135
3.99	-0.691	-0.628	-0.631	-0.570	-0.543	-0.484	-0.368	-0.300	-0.258	-0.245	-0.186
5.11	-0.540	-0.517	-0.466	-0.423	-0.324	-0.248	-0.218	-0.179	-0.202	-0.153	-0.094
6.00	-0.359	-0.387	-0.280	-0.197	-0.172	-0.124	-0.104	-0.065	-0.091	-0.082	-0.016
7.01	-0.113	-0.105	-0.094	-0.016	0.038	0.044	0.072	0.087	0.077	0.066	0.094
8.00	-0.086	-0.086	-0.028	0.012	0.032	0.051	0.075	0.067	0.069	0.035	0.041
9.00	-0.178	-0.134	-0.028	0.007	-0.070	-0.033	-0.056	-0.044	-0.044	-0.064	-0.091
9.69	-0.079	-0.149	-0.036	-0.065	-0.026	-0.050	-0.097	0.001	-0.020	-0.034	-0.025
0.010	-2.517	-2.016	-1.563	-1.072	-0.682	-0.105	0.324	0.759	1.206	1.602	1.985
0.20	-2.196	-1.604	-1.092	-0.777	-0.395	-0.058	0.272	0.615	0.962	1.304	1.617
0.30	-1.064	-0.981	-0.701	-0.393	-0.073	0.217	0.526	0.822	1.150	1.458	1.742
0.40	-0.753	-0.545	-0.287	-0.073	0.204	0.633	0.704	0.989	1.259	1.691	1.997
0.74	-0.298	-0.047	0.012	0.227	0.417	0.630	0.856	1.084	1.331	1.608	1.909
0.99	-0.268	-0.092	0.080	0.272	0.426	0.630	0.835	1.025	1.221	1.460	1.703
1.145	-0.240	-0.120	0.003	0.174	0.271	0.410	0.559	0.733	0.890	0.925	0.935
2.200	-0.158	-0.072	0.025	0.144	0.255	0.379	0.468	0.557	0.701	0.806	0.872
2.50	-0.162	-0.064	0.031	0.114	0.219	0.292	0.404	0.484	0.592	0.691	0.767
3.00	-0.115	-0.035	0.036	0.117	0.203	0.272	0.352	0.440	0.510	0.602	0.666
3.99	-0.078	-0.011	0.047	0.102	0.179	0.243	0.287	0.357	0.414	0.501	0.568
5.11	-0.058	-0.009	0.059	0.099	0.129	0.197	0.226	0.267	0.329	0.367	0.414
6.00	0.001	0.029	0.073	0.137	0.147	0.166	0.194	0.231	0.273	0.303	0.344
7.01	0.124	0.154	0.178	0.188	0.195	0.228	0.289	0.344	0.386	0.424	0.461
8.00	0.050	0.062	0.054	0.071	0.059	0.069	0.083	0.097	0.108	0.120	0.133
9.00	-0.088	-0.150	-0.125	-0.041	-0.044	-0.139	-0.136	-0.116	-0.110	-0.121	-0.117
9.69	-0.039	-0.137	-0.105	-0.058	-0.086	-0.069	-0.095	-0.074	-0.089	-0.098	-0.094

$$M = 0.597 \quad R_n = 3.1 \times 10^6$$

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

$$M = 0.597 \quad R_n = 6.2 \times 10^6$$

ALPHA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
-0.491	-3.175	-2.511	-2.702	-2.491	-2.892	-1.809	-1.362	-1.273	-1.205	-0.947	-0.671	-0.507	-0.422	-0.734	-0.800	-0.153	-0.021
-0.747	-3.249	-2.511	-2.732	-2.519	-2.732	-1.628	-1.465	-1.267	-1.205	-0.843	-0.653	-0.507	-0.416	-0.328	-0.132	-0.081	-0.049
-0.675	-2.595	-2.611	-2.373	-2.483	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.707	-2.702	-2.511	-2.373	-2.483	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.004	-2.892	-2.511	-2.373	-2.483	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.018	-2.892	-2.511	-2.373	-2.483	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.374	-3.295	-2.611	-2.373	-2.519	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-7.767	-3.406	-2.722	-2.373	-2.519	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.611	-2.722	-2.611	-2.373	-2.519	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-0.034	-2.722	-2.611	-2.373	-2.519	-2.447	-1.768	-1.560	-1.273	-1.205	-0.936	-0.697	-0.579	-0.435	-0.264	-0.132	-0.075	-0.049
-7.170	-3.700	-2.892	-2.051	-1.883	-2.455	-2.078	-1.698	-1.402	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-0.582	-2.051	-2.200	-2.051	-2.051	-2.051	-2.051	-1.748	-1.358	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-0.033	-2.051	-2.200	-2.051	-2.051	-2.051	-2.051	-1.748	-1.358	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-6.568	-3.598	-2.200	-2.051	-2.051	-2.051	-2.051	-1.748	-1.358	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-0.514	-2.200	-2.200	-2.051	-2.051	-2.051	-2.051	-1.748	-1.358	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-0.046	-2.200	-2.200	-2.051	-2.051	-2.051	-2.051	-1.748	-1.358	-1.095	-0.827	-0.697	-0.548	-0.394	-0.235	-0.095	-0.043	-0.018
-5.963	-3.029	-2.570	-2.330	-2.330	-2.255	-1.846	-1.614	-1.216	-0.904	-0.664	-0.490	-0.347	-0.257	-0.104	0.049	0.082	0.031
-0.482	-2.570	-2.570	-2.330	-2.330	-2.255	-1.846	-1.614	-1.216	-0.904	-0.664	-0.490	-0.347	-0.257	-0.104	0.049	0.082	0.031
-0.044	-2.570	-2.570	-2.330	-2.330	-2.255	-1.846	-1.614	-1.216	-0.904	-0.664	-0.490	-0.347	-0.257	-0.104	0.049	0.082	0.031
-4.774	-3.168	-2.858	-2.611	-2.447	-1.979	-1.566	-1.332	-0.714	-0.584	-0.444	-0.342	-0.286	-0.214	-0.165	-0.079	0.057	0.023
-0.389	-2.858	-2.858	-2.611	-2.447	-1.979	-1.566	-1.332	-0.714	-0.584	-0.444	-0.342	-0.286	-0.214	-0.165	-0.079	0.057	0.023
-0.032	-2.858	-2.858	-2.611	-2.447</													

ALPHA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
0.010	-2.976	-2.332	-1.729	-1.152	-0.447	0.103	0.678	1.298	1.933	2.471	3.763																																																																																									
0.020	-2.740	-2.153	-1.542	-1.066	-0.719	-0.390	-0.197	0.185	0.625	1.023	1.794																																																																																									
0.030	-1.674	-1.250	-0.835	-0.748	-0.444	-0.138	-0.089	0.335	0.686	1.017	1.687																																																																																									
0.049	-0.966	-0.757	-0.531	-0.748	-0.282	0.026	0.495	0.675	0.894	1.108	1.714																																																																																									
0.074	-0.601	-0.397	-0.205	0.004	0.229	0.443	0.632	0.886	1.045	1.337	1.961																																																																																									
0.099	-0.464	-0.297	-0.124	0.057	0.254	0.451	0.628	0.824	1.039	1.369	1.949																																																																																									
0.145	-0.329	-0.222	-0.084	0.046	0.182	0.319	0.471	0.632	0.753	0.829	1.115																																																																																									
0.200	-0.301	-0.203	-0.095	0.021	0.135	0.248	0.330	0.480	0.591	0.661	0.927																																																																																									
0.250	-0.243	-0.155	-0.074	0.026	0.121	0.221	0.317	0.419	0.514	0.616	0.787																																																																																									
0.300	-0.175	-0.101	-0.023	0.078	0.141	0.234	0.309	0.386	0.469	0.558	0.707																																																																																									
0.399	-0.122	-0.061	-0.006	0.057	0.127	0.192	0.259	0.326	0.379	0.459	0.567																																																																																									
0.501	-0.096	-0.051	-0.015	0.053	0.089	0.143	0.188	0.235	0.285	0.338	0.428																																																																																									
0.603	-0.093	-0.004	0.024	0.066	0.104	0.135	0.190	0.217	0.270	0.309	0.379																																																																																									
0.701	0.102	0.124	0.140	0.171	0.196	0.222	0.245	0.269	0.292	0.315	0.366																																																																																									
0.800	0.042	0.051	0.071	0.091	0.079	0.079	0.118	0.117	0.136	0.136	0.164																																																																																									
0.900	-0.103	-0.117	-0.113	-0.126	-0.118	-0.107	-0.132	-0.117	-0.092	-0.094	-0.094																																																																																									
0.999	-0.017	-0.046	-0.041	-0.055	-0.055	-0.069	-0.072	-0.075	-0.062	-0.062	-0.092																																																																																									

. AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.609 Re = 9.1 x 10⁶

SOLID FLOOR AND CEILING

ALPHA	3.233	3.897	4.273	4.765	5.317	5.836	6.363	6.842	7.372	7.909	8.427
CN	0.600	0.684	0.733	0.804	0.886	0.924	0.954	0.974	0.982	1.000	1.000
CM	-0.004	0.001	0.001	0.006	0.013	0.021	0.025	0.028	0.032	0.010	-0.003
DCP 1	-0.10	2.482	2.783	3.225	3.481	3.635	3.778	3.853	3.859	3.534	3.562
DCP 2	-0.20	2.065	2.266	2.615	3.036	3.237	3.395	3.490	3.614	3.601	3.647
DCP 3	-0.30	2.063	2.214	2.462	2.915	3.124	3.294	3.385	3.496	3.503	3.572
DCP 4	-0.49	1.568	2.430	2.505	2.831	3.023	3.185	3.275	3.395	3.410	3.470
DCP 5	-0.74	1.942	2.535	2.658	2.845	3.035	3.151	3.246	3.323	3.276	3.176
DCP 6	-0.99	1.777	2.587	2.751	2.910	3.062	3.153	3.246	3.091	2.880	2.650
DCP 7	-1.49	1.167	1.237	1.822	2.561	2.632	2.536	2.263	2.273	1.779	1.635
DCP 8	-2.00	1.020	1.032	1.125	1.405	1.405	1.564	1.755	1.836	1.501	1.455
DCP 9	-2.50	0.798	0.537	0.954	0.995	1.127	1.248	1.436	1.401	1.485	1.456
DCP 10	-3.00	0.705	0.832	0.866	0.862	0.844	0.595	1.109	1.161	1.361	1.246
DCP 11	-3.95	0.590	0.695	0.732	0.773	0.773	0.783	0.801	0.837	0.992	1.027
DCP 12	-5.01	0.429	0.518	0.547	0.575	0.571	0.566	0.572	0.582	0.664	0.729
DCP 13	-6.00	0.364	0.431	0.444	0.465	0.464	0.448	0.439	0.394	0.514	0.557
DCP 14	-7.01	0.373	0.404	0.404	0.395	0.395	0.375	0.353	0.323	0.356	0.386
DCP 15	-8.00	0.177	0.179	0.200	0.199	0.191	0.172	0.140	0.172	0.157	0.192
DCP 16	-9.00	-0.076	-0.078	-0.059	-0.063	-0.075	-0.071	-0.092	-0.066	0.002	0.068
DCP 17	-9.69	-0.085	-0.082	-0.091	-0.090	-0.090	-0.084	-0.075	-0.109	-0.046	-0.035

ALPHA	8.949	9.469	9.972	10.465	10.989	11.547	12.041	12.587	13.091	13.586	14.116
CN	0.591	0.943	0.585	0.994	0.932	0.946	0.885	0.900	0.972	0.581	1.056
CM	-0.015	-0.007	-0.037	-0.026	-0.032	-0.036	-0.048	-0.056	-0.055	-0.071	-0.054
DCP 1	-0.10	3.544	3.714	3.684	4.077	3.582	4.071	3.907	3.370	3.622	3.270
DCP 2	-0.20	3.683	3.674	3.641	3.654	3.085	3.636	3.470	2.734	3.124	2.578
DCP 3	-0.30	3.602	3.715	3.665	3.517	2.940	3.231	3.059	3.047	2.937	2.963
DCP 4	-0.49	3.176	3.435	3.091	2.442	2.488	2.207	2.398	2.155	2.654	2.740
DCP 5	-0.74	2.544	2.743	2.605	1.730	2.081	1.572	1.575	1.941	1.710	2.442
DCP 6	-0.99	2.214	2.366	2.395	1.634	1.575	1.439	1.501	1.893	1.661	2.349
DCP 7	-1.49	1.745	1.362	1.601	1.533	1.735	1.298	1.303	1.709	1.422	1.896
DCP 8	-2.00	1.472	1.215	1.380	1.401	1.440	1.286	1.286	1.560	1.430	1.638
DCP 9	-2.50	1.332	1.198	1.322	1.226	1.297	1.174	1.237	1.483	1.298	1.501
DCP 10	-3.00	1.152	0.955	1.055	0.979	1.036	1.091	1.072	1.066	1.240	1.396
DCP 11	-3.99	0.957	0.955	0.810	0.814	0.776	0.847	0.828	0.775	1.101	1.155
DCP 12	-5.01	0.765	0.813	0.665	0.591	0.650	0.646	0.735	0.693	0.515	0.834
DCP 13	-6.00	0.534	0.665	0.502	0.462	0.494	0.499	0.582	0.586	0.654	0.735
DCP 14	-7.01	0.465	0.492	0.502	0.317	0.322	0.374	0.374	0.418	0.435	0.434
DCP 15	-8.00	0.276	0.386	0.317	0.315	0.322	0.361	0.374	0.418	0.435	0.434
DCP 16	-9.00	0.044	0.171	0.594	0.085	0.086	0.115	0.116	0.135	0.179	0.154
DCP 17	-9.69	-0.028	0.046	-0.049	-0.065	-0.050	-0.042	0.024	-0.010	0.047	-0.016

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.609 Re = 9.1×10^6 SOLID FLOOR AND CEILING

ALPHA	14.666	15.169	15.649	16.176	16.720
CN	1.061	1.081	1.063	1.083	1.086
CM	-0.070	-0.078	-0.083	-0.087	-0.090
DCP 1	.013	3.492	3.417	3.125	3.249
DCP 2	.020	2.630	3.340	2.411	2.935
DCP 3	.030	2.594	1.563	3.028	3.114
DCP 4	.049	2.377	2.484	2.530	2.426
DCP 5	.074	2.173	2.185	2.190	2.189
DCP 6	.099	2.098	2.211	2.178	2.002
DCP 7	.149	1.833	1.972	1.855	1.758
DCP 8	.200	1.644	1.803	1.604	1.623
DCP 9	.253	1.480	1.194	1.390	1.541
DCP 10	.303	1.334	1.085	1.292	1.370
DCP 11	.399	1.188	1.075	1.122	1.045
DCP 12	.531	0.964	0.927	1.002	0.925
DCP 13	.600	0.773	0.824	0.857	0.825
DCP 14	.701	0.664	0.757	0.746	0.757
DCP 15	.803	0.482	0.605	0.562	0.601
DCP 16	.900	0.179	0.235	0.254	0.309
DCP 17	.969	0.024	0.026	0.017	0.061

$$M = 0.705 \quad Rn = 10.0 \times 10^6$$

SOLID FLOOR AND CEILING

0.01C	-1.917	-2.910	-3.136	-3.137	-3.257	-3.215	-3.271	-3.199	-3.154	-3.058	-2.957
0.020	-2.798	-2.846	-2.879	-2.932	-2.977	-3.102	-3.120	-3.053	-3.014	-2.897	-2.772
0.030	-2.530	-2.580	-2.671	-2.740	-2.794	-2.897	-2.901	-2.716	-2.786	-2.672	-2.537
0.049	-2.199	-2.255	-2.346	-2.739	-2.681	-2.623	-2.595	-2.505	-2.429	-2.289	-2.122
0.074	-1.747	-1.806	-1.867	-2.438	-2.378	-2.323	-2.284	-2.189	-2.100	-1.967	-1.784
0.099	-1.656	-1.606	-1.708	-2.400	-2.188	-2.089	-2.100	-2.021	-1.935	-1.793	-1.607
0.149	-1.410	-1.417	-1.444	-1.794	-1.888	-1.895	-1.833	-1.763	-1.759	-1.612	-1.395
0.200	-0.707	-0.717	-1.005	-1.005	-1.016	-0.972	-1.100	-1.021	-1.076	-0.631	-0.354
0.250	-0.680	-0.732	-1.112	-0.999	-0.710	-0.667	-0.917	-0.745	-0.691	-0.337	-0.298
0.300	-0.618	-0.709	-0.960	-0.777	-0.613	-0.887	-0.917	-0.494	-0.366	-0.243	-0.194
0.351	-0.616	-0.735	-0.799	-0.551	-0.512	-0.681	-0.622	-0.477	-0.212	-0.221	-0.158
0.401	-0.586	-0.570	-0.467	-0.519	-0.518	-0.444	-0.385	-0.318	-0.179	-0.190	-0.170
0.451	-0.426	-0.378	-0.342	-0.444	-0.464	-0.244	-0.134	-0.111	-0.100	-0.099	-0.094
0.501	-0.225	-0.247	-0.344	-0.183	-0.464	-0.231	0.087	0.101	0.076	0.077	0.054
0.551	-0.239	-0.187	-0.068	-0.187	-0.194	0.011	0.087	0.098	0.029	0.018	0.021
0.601	-0.342	-0.353	-0.245	-0.245	-0.201	-0.070	-0.087	-0.038	-0.111	-0.135	-0.125
0.651	-0.144	-0.118	-0.070	-0.122	-0.090	-0.045	-0.004	-0.024	-0.063	-0.038	-0.026

[illegible]

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

SOLID FLOOR AND CEILING

M = 0.705 Re = 10.0 x 10⁶

ALPHA	3.609	4.231	4.871	5.490	6.061	6.648	7.290	7.854	8.447	9.099	9.720
C _L	0.673	0.782	0.835	0.825	0.848	0.867	0.893	0.921	0.930	0.891	0.875
C _D	-0.001	-0.001	0.002	0.008	0.002	0.002	-0.001	-0.005	-0.006	-0.027	-0.035
C _{DP} 1	-0.1C	1.374	1.614	1.598	2.111	2.260	2.381	2.464	2.575	2.647	2.680
C _{DP} 2	0.020	1.252	1.611	1.723	1.833	1.979	2.131	2.231	2.367	2.457	2.494
C _{DP} 3	0.030	1.277	1.424	1.660	1.740	1.988	2.039	2.146	2.260	2.357	2.491
C _{DP} 4	0.049	1.549	1.668	1.854	1.902	1.966	2.076	2.174	2.270	2.345	2.379
C _{DP} 5	0.074	1.692	1.805	1.999	2.034	2.089	2.165	2.234	2.320	2.396	2.422
C _{DP} 6	0.099	1.795	1.902	2.004	2.034	2.157	2.221	2.279	2.355	2.410	2.411
C _{DP} 7	0.149	1.776	1.886	2.004	2.086	2.131	2.175	2.218	2.271	2.319	2.319
C _{DP} 8	0.200	1.719	1.824	1.985	2.021	2.069	2.118	2.139	1.948	1.887	1.873
C _{DP} 9	0.250	1.666	1.776	1.936	1.927	1.696	1.570	1.544	1.587	1.543	0.973
C _{DP} 10	0.300	0.902	1.668	1.195	1.193	1.199	1.243	1.248	1.274	0.992	0.932
C _{DP} 11	0.399	0.439	0.730	0.965	0.959	1.000	0.952	0.998	1.048	0.946	0.916
C _{DP} 12	0.501	0.343	0.343	0.630	0.617	0.661	0.718	0.738	0.792	0.752	0.686
C _{DP} 13	0.600	0.349	0.264	0.308	0.439	0.450	0.503	0.535	0.495	0.498	0.448
C _{DP} 14	0.701	0.363	0.286	0.212	0.240	0.270	0.303	0.321	0.318	0.422	0.473
C _{DP} 15	0.800	0.165	0.139	0.085	0.112	0.097	0.122	0.121	0.167	0.271	0.327
C _{DP} 16	0.900	-0.099	-0.114	-0.126	-0.114	-0.106	-0.118	-0.118	-0.047	0.060	0.101
C _{DP} 17	0.969	-0.070	-0.069	-0.079	-0.076	-0.091	-0.060	-0.048	-0.082	-0.001	0.007

ALPHA	10.290	10.818	11.511	12.116	12.619	13.264	13.880	14.469	15.090	15.656	17.507
C _L	0.913	0.931	0.968	0.929	0.945	0.970	0.990	1.003	1.036	1.048	1.097
C _D	-0.036	-0.44	-0.039	-0.049	-0.052	-0.054	-0.057	-0.064	-0.070	-0.073	-0.109
C _{DP} 1	0.010	2.848	2.920	2.929	2.998	3.073	3.078	3.141	3.199	3.226	2.702
C _{DP} 2	0.020	2.692	2.787	2.783	2.867	2.954	2.980	3.041	3.116	3.173	2.564
C _{DP} 3	0.030	2.578	2.669	2.679	2.755	2.843	2.876	2.942	2.994	3.006	2.839
C _{DP} 4	0.049	2.472	2.543	2.636	2.709	2.753	2.776	2.767	2.769	2.709	1.881
C _{DP} 5	0.074	2.408	2.561	2.607	2.622	2.647	2.661	2.643	2.600	2.529	1.863
C _{DP} 6	0.099	2.473	2.468	2.461	2.477	2.456	2.487	2.446	2.400	2.324	1.754
C _{DP} 7	0.149	2.056	1.940	1.912	1.971	2.080	2.133	2.171	2.176	2.195	1.671
C _{DP} 8	0.200	1.135	1.634	1.055	1.038	1.056	1.100	1.042	1.137	1.147	1.723
C _{DP} 9	0.250	1.071	1.436	1.014	0.976	1.051	1.054	1.076	1.099	1.092	1.463
C _{DP} 10	0.300	0.987	0.987	0.906	0.934	0.958	1.000	0.969	1.035	1.024	1.256
C _{DP} 11	0.399	0.930	0.951	0.905	0.907	0.868	0.914	0.938	0.977	1.004	1.236
C _{DP} 12	0.501	0.745	0.782	0.713	0.684	0.842	0.769	0.743	0.908	0.891	0.931
C _{DP} 13	0.600	0.595	0.588	0.671	0.700	0.705	0.677	0.731	0.732	0.781	0.854
C _{DP} 14	0.701	0.574	0.564	0.620	0.559	0.581	0.581	0.581	0.718	0.728	0.808
C _{DP} 15	0.800	0.339	0.377	0.431	0.555	0.455	0.565	0.569	0.573	0.562	0.664
C _{DP} 16	0.900	0.184	0.066	0.176	0.208	0.225	0.233	0.270	0.268	0.270	0.342
C _{DP} 17	0.969	0.005	0.005	0.016	-0.019	0.055	-0.022	0.014	0.010	0.015	0.027

AIRFOIL NLR 7223-62 STEADY FORCES AND MOMENTS

M = 0.705 $R_n = 10.0 \times 10^6$ SOLID FLOOR AND CEILING

ALPHA	18.140	18.696	19.276	19.903
C _L	1.068	1.138	1.180	1.199
C _D	-0.115	-0.123	-0.136	-0.146
C _{DP} 1	0.010	2.527	2.721	2.643
C _{DP} 2	-0.020	2.467	2.634	2.635
C _{DP} 3	-0.030	2.855	2.692	2.598
C _{DP} 4	-0.049	1.774	1.785	1.865
C _{DP} 5	-0.074	1.661	1.724	1.789
C _{DP} 6	-0.099	1.591	1.659	1.707
C _{DP} 7	-0.145	1.480	1.577	1.596
C _{DP} 8	-0.200	1.696	1.734	1.767
C _{DP} 9	-0.250	1.774	1.787	1.802
C _{DP} 10	-0.300	1.506	1.613	1.637
C _{DP} 11	-0.399	1.101	1.261	1.404
C _{DP} 12	-0.501	0.913	1.079	1.182
C _{DP} 13	-0.600	0.883	1.003	1.056
C _{DP} 14	-0.701	0.854	0.843	0.841
C _{DP} 15	-0.800	0.717	0.699	0.754
C _{DP} 16	-0.900	0.381	0.297	0.411
C _{DP} 17	-0.968	-0.076	0.077	0.118

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

ENERGY PITCHING OSCILLATION										
AIRPORT MLP 1										
DATA TYPE	TIME Hz	WAVE Hz	K	MACH NO	DEL ALPHA	DEL M	ALPHA 0	TEST POINT	CYCLES ANALYSED	
	0.0	22.89	0.155	0.210	2.61	0.0	0.05	12093.1	20	
	V 75.2 (246.6)	0 14163 (295.8)	PM	CHIMIN	CHIMAX	ALPHA MAX	REFD DAMP	YDR	ENT DAMP	
			0.39E 07	-0.040	0.320	2.62	-0.00125	0.740	0.0	
HARMONIC ANALYSIS										
DATA TYPE	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA	0.050	2.607 0	0.059 357	0.061 210	0.020 130	0.015 35	0.021 46	0.012 159	0.025 33	0.009 344
CM	0.136	0.169 399	0.009 282	0.008 163	0.005 232	0.002 225	0.004 48	0.002 161	0.017 18	0.002 34
	-0.024	0.010 300	0.001 44	0.001 331	0.002 50	0.001 4	0.001 248	0.001 79	0.003 202	0.000 395
YCP 1	-0.482	1.727 346	0.024 343	0.014 150	0.012 229	0.017 274	0.008 330	0.013 10	0.020 323	0.017 31
YCP 2	-0.311	0.904 349	0.032 282	0.007 299	0.006 355	0.001 355	0.010 47	0.003 284	0.027 245	0.013 36
YCP 3	-0.310	0.781 349	0.070 293	0.004 197	0.002 126	0.001 236	0.014 38	0.004 42	0.016 332	0.007 44
YCP 4	-0.440	0.633 349	0.010 310	0.012 146	0.007 308	0.006 197	0.005 207	0.004 42	0.017 343	0.002 13
YCP 5	-0.74	0.502 350	0.010 306	0.009 167	0.009 222	0.009 308	0.004 353	0.004 47	0.011 349	0.010 58
YCP 6	-0.499	0.426 352	0.004 8	0.011 146	0.003 325	0.008 241	0.005 4	0.004 101	0.009 339	0.014 12
YCP 7	-0.241	0.323 354	0.009 284	0.007 150	0.007 301	0.007 222	0.007 55	0.004 254	0.010 0	0.005 5
YCP 8	-0.149	0.242 358	0.004 1	0.007 154	0.007 91	0.010 331	0.006 43	0.004 81	0.016 332	0.009 20
YCP 9	-0.200	0.223 357	0.009 44	0.012 145	0.014 254	0.005 306	0.006 355	0.005 98	0.023 357	0.001 251
YCP 10	-0.213	0.188 358	0.003 321	0.009 145	0.003 267	0.006 299	0.007 204	0.004 84	0.018 27	0.005 146
YCP 11	-0.199	0.153 4	0.004 313	0.015 141	0.003 77	0.004 115	0.004 44	0.011 179	0.019 4	0.007 223
YCP 12	-0.192	0.113 10	0.006 117	0.012 183	0.017 202	0.011 244	0.012 44	0.006 63	0.022 5	0.003 252
YCP 13	-0.203	-0.057 20	0.004 114	0.007 212	0.012 249	0.005 170	0.004 226	0.005 277	0.018 25	0.009 109
YCP 14	-0.130	0.039 38	0.012 203	0.001 37	-0.006 153	0.003 152	0.010 154	0.006 255	0.022 20	0.005 154
YCP 15	-0.053	0.015 85	0.005 239	0.010 110	0.008 374	0.008 42	0.010 87	0.004 350	0.010 16	0.004 54
YCP 16	-0.069	0.314 135	0.010 235	0.004 111	0.008 230	0.017 250	0.012 342	0.023 106	0.021 6	0.012 286

ENERGY PITCHING OSCILLATION										
AIRPORT MLP 1										
DATA TYPE	TIME Hz	WAVE Hz	K	MACH NO	DEL ALPHA	DEL M	ALPHA 0	TEST POINT	CYCLES ANALYSED	
	0.0	22.89	0.162	0.210	2.61	0.0	2.45	12093.2	20	
	V 71.9 (275.8)	0 13205 (275.8)	PM	CHIMIN	CHIMAX	ALPHA MAX	REFD DAMP	YDR	ENT DAMP	
			0.34E 07	-0.034	0.340	5.03	-0.00113	0.643	0.0	
HARMONIC ANALYSIS										
DATA TYPE	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA	2.449	0.009 0	0.059 357	0.062 220	0.015 130	0.018 357	0.022 33	0.014 127	0.004 193	0.010 331
CM	0.348	0.185 356	0.003 300	0.002 99	0.003 206	0.003 250	0.001 305	0.001 177	0.004 3	0.071 98
	-0.020	0.008 200	0.001 89	0.001 59	0.002 359	0.001 133	0.001 112	0.001 117	0.001 146	0.001 180
YCP 1	0.978	1.263 345	0.028 32	0.013 18	0.008 206	0.017 194	0.014 78	0.011 80	0.022 354	0.007 149
YCP 2	0.647	0.906 348	0.013 16	0.012 40	0.007 43	0.015 241	0.010 79	0.008 99	0.013 34	0.013 193
YCP 3	0.940	0.801 348	0.010 16	0.017 32	0.002 12	0.007 205	0.007 12	0.008 169	0.014 39	0.009 144
YCP 4	0.731	0.693 349	0.002 291	0.016 53	0.003 244	0.002 351	0.006 82	0.007 160	0.021 69	0.005 230
YCP 5	0.716	0.541 349	0.004 320	0.004 122	0.005 49	0.009 260	0.003 117	0.009 151	0.008 13	0.005 147
YCP 6	0.874	0.453 352	0.003 20	0.008 80	0.002 214	0.004 224	0.006 341	0.009 88	0.010 72	0.007 137
YCP 7	0.827	0.349 351	0.007 291	0.015 85	0.008 340	0.007 226	0.000 44	0.001 120	0.013 17	0.011 134
YCP 8	0.744	0.284 346	0.011 103	0.016 58	0.007 199	0.009 241	0.006 188	0.001 137	0.010 33	0.012 131
YCP 9	0.460	0.246 355	0.007 307	0.008 163	0.008 299	0.002 245	0.010 159	0.001 177	0.002 161	0.004 244
YCP 10	0.457	0.203 358	0.007 390	0.004 139	0.004 314	0.002 145	0.007 324	0.005 164	0.004 7	0.008 107
YCP 11	0.391	0.164 5	0.006 289	0.004 139	0.004 342	0.002 25	0.007 248	0.006 184	0.007 319	0.005 230
YCP 12	0.260	0.116 6	0.004 342	0.004 131	0.005 194	0.005 209	0.004 205	0.004 27	0.015 24	0.010 315
YCP 13	0.600	0.087 10	0.004 119	0.006 258	0.004 15	0.007 218	0.004 205	0.009 160	0.012 337	0.004 287
YCP 14	0.3	0.064 23	0.006 291	0.004 60	0.005 86	0.008 325	0.003 313	0.011 205	0.005 355	0.001 333
YCP 15	0.149	0.041 24	0.009 277	0.003 207	0.009 161	0.008 318	0.005 42	0.008 183	0.010 327	0.003 104
YCP 16	-0.049	0.017 57	0.008 196	0.005 168	0.018 173	0.002 136	0.007 274	0.017 337	0.006 261	0.008 16
YCP 17	0.64	0.004 165	0.007 306	0.013 235	0.013 235	0.006 340	0.002 283	0.007 137	0.005 80	0.008 48

[illegible]

[illegible]

ENERGEN PITCHING OSCILLATION									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68
MASTING ANALYSIS									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68
CYCLES ANALYSIS									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68

ENERGEN PITCHING OSCILLATION									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68
MASTING ANALYSIS									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68
CYCLES ANALYSIS									
TYPE	TIME	WZ	K	WZ	WZ	WZ	WZ	WZ	WZ
ALPHA	99.6	26095	0.117	0.254	0.254	0.254	0.254	0.254	0.254
WZ	326.6	(545.0)	0.48E 07	-0.716	1.065	10.12	7.68	7.68	7.68

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL NLR 1				CYCLES ANALYSED			
		TUNED MZ 0.0	ORIVE MZ 45.45	K 0.216	MACH NO 0.314	DEL-ALPHA 2.82	DEL-H 0.0	ALPHA-0 0.10	ALPHA-0 0.10	TEST POINT 12099.1	EXT DAMP 0.0	TEST POINT 12099.1	EXT DAMP 0.0
ALPHA		0.102	2.821	0	0.091 242	0.004 127	0.029 85	0.024 51	0.011 170	0.011 170	0.011 170	0.011 170	0.011 170
CH		0.102	0.190	2	0.005 8	0.005 127	0.002 197	0.002 41	0.002 211	0.002 211	0.002 211	0.002 211	0.002 211
CM		-0.013	0.013 293	0.001 288	0.001 254	0.002 159	0.000 110	0.001 295	0.001 337	0.001 337	0.001 337	0.001 337	0.001 337
DCP 1	-0.010	-0.489	1.350 344	0.042 353	0.012 187	0.007 330	0.035 164	0.021 349	0.009 162	0.009 162	0.014 74	0.009 162	0.009 162
DCP 2	-0.020	-0.281	1.028 340	0.023 292	0.020 319	0.004 328	0.005 203	0.005 399	0.011 140	0.011 140	0.010 130	0.011 140	0.010 130
DCP 3	-0.030	-0.049	0.857 349	0.021 301	0.016 309	0.006 177	0.009 217	0.004 3	0.007 184	0.007 184	0.004 71	0.007 184	0.004 71
DCP 4	-0.040	0.143	0.857 350	0.013 336	0.016 340	0.007 177	0.007 176	0.002 210	0.002 93	0.002 93	0.001 140	0.002 93	0.001 140
DCP 5	-0.050	0.244	0.582 351	0.010 350	0.009 321	0.007 177	0.009 141	0.001 285	0.002 93	0.002 93	0.002 40	0.002 93	0.002 40
DCP 6	-0.060	0.319	0.484 352	0.009 344	0.010 336	0.006 197	0.006 149	0.002 227	0.005 149	0.005 149	0.004 91	0.005 149	0.004 91
DCP 7	-0.070	0.228	0.360 353	0.008 347	0.004 85	0.003 181	0.002 264	0.004 72	0.006 189	0.006 189	0.006 132	0.006 189	0.006 132
DCP 8	-0.080	0.167	0.286 3	0.004 352	0.004 85	0.006 7	0.011 178	0.005 244	0.003 214	0.003 214	0.007 124	0.003 214	0.007 124
DCP 9	-0.090	0.143	0.256 2	0.004 352	0.008 346	0.008 304	0.005 172	0.007 37	0.004 150	0.004 150	0.002 117	0.004 150	0.002 117
DCP10	-0.100	0.153	0.210 12	0.004 352	0.010 351	0.003 340	0.002 207	0.009 6	0.003 174	0.003 174	0.007 138	0.003 174	0.007 138
DCP11	-0.110	0.137	0.170 12	0.004 352	0.012 13	0.009 317	0.005 247	0.004 18	0.004 208	0.004 208	0.006 192	0.004 208	0.006 192
DCP12	-0.120	0.098	0.131 19	0.002 20	0.005 64	0.003 326	0.009 172	0.001 317	0.001 303	0.001 303	0.007 176	0.001 303	0.007 176
DCP13	-0.130	0.100	0.104 27	0.003 182	0.004 326	0.007 306	0.004 254	0.007 66	0.002 249	0.002 249	0.004 146	0.002 249	0.004 146
DCP14	-0.140	0.089	0.089 34	0.001 182	0.006 39	0.005 16	0.003 331	0.007 193	0.006 62	0.006 62	0.009 157	0.006 62	0.009 157
DCP15	-0.150	0.075	0.046 46	0.007 26	0.003 89	0.008 352	0.003 263	0.003 104	0.004 201	0.004 201	0.004 173	0.004 201	0.004 173
DCP16	-0.160	-0.075	0.024 74	0.004 124	0.005 132	0.008 286	0.002 87	0.004 104	0.003 241	0.003 241	0.007 147	0.003 241	0.007 147
DCP17	-0.170	-0.034	0.012 159	0.001 109	0.001 5	0.021 358	0.004 333	0.007 35	0.006 293	0.006 293	0.006 87	0.006 293	0.006 87

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL NLR 1				CYCLES ANALYSED			
		TUNED MZ 0.0	ORIVE MZ 45.46	K 0.222	MACH NO 0.306	DEL-ALPHA 2.75	DEL-H 0.0	ALPHA-0 2.49	ALPHA-0 2.49	TEST POINT 12099.2	EXT DAMP 0.0	TEST POINT 12099.2	EXT DAMP 0.0
ALPHA		0.102	2.754	0	0.095 240	0.017 305	0.031 20	0.023 44	0.017 263	0.017 263	0.017 263	0.017 263	0.017 263
CH		0.102	0.191	1	0.003 342	0.009 336	0.001 274	0.003 4	0.002 192	0.002 192	0.004 350	0.002 192	0.004 350
CM		-0.008	0.013 292	0.001 33	0.001 190	0.003 181	0.001 98	0.001 143	0.002 53	0.002 53	0.002 15	0.002 53	0.002 15
DCP 1	-0.010	-0.489	1.352 341	0.032 34	0.023 38	0.013 347	0.012 68	0.019 336	0.004 47	0.004 47	0.003 30	0.004 47	0.003 30
DCP 2	-0.020	-0.281	1.042 346	0.016 17	0.010 249	0.008 300	0.004 161	0.006 42	0.013 91	0.013 91	0.006 253	0.013 91	0.006 253
DCP 3	-0.030	-0.049	0.863 348	0.013 17	0.007 255	0.003 340	0.001 141	0.003 128	0.006 99	0.006 99	0.006 233	0.006 99	0.006 233
DCP 4	-0.040	0.143	0.857 349	0.009 61	0.008 270	0.004 323	0.003 148	0.010 153	0.005 135	0.005 135	0.005 321	0.005 135	0.005 321
DCP 5	-0.050	0.244	0.575 350	0.009 38	0.005 221	0.001 243	0.001 262	0.004 33	0.004 68	0.004 68	0.003 53	0.004 68	0.003 53
DCP 6	-0.060	0.319	0.474 352	0.014 51	0.008 257	0.008 253	0.004 156	0.001 56	0.006 60	0.006 60	0.004 302	0.006 60	0.004 302
DCP 7	-0.070	0.228	0.375 353	0.007 55	0.004 91	0.007 268	0.002 91	0.004 21	0.006 91	0.006 91	0.006 176	0.006 91	0.006 176
DCP 8	-0.080	0.167	0.296 1	0.010 84	0.004 214	0.005 284	0.006 48	0.001 95	0.006 92	0.006 92	0.006 309	0.006 92	0.006 309
DCP 9	-0.090	0.143	0.259 0	0.003 133	0.003 4	0.016 330	0.002 253	0.007 1	0.011 180	0.011 180	0.005 234	0.011 180	0.005 234
DCP10	-0.100	0.153	0.207 3	0.005 291	0.010 344	0.010 344	0.003 129	0.002 307	0.006 213	0.006 213	0.006 302	0.006 213	0.006 302
DCP11	-0.110	0.137	0.165 14	0.004 93	0.005 16	0.015 350	0.010 286	0.003 66	0.013 235	0.013 235	0.009 2	0.013 235	0.009 2
DCP12	-0.120	0.098	0.131 18	0.007 80	0.010 266	0.015 348	0.002 44	0.007 43	0.007 263	0.007 263	0.005 323	0.007 263	0.005 323
DCP13	-0.130	0.209	0.106 23	0.010 90	0.004 198	0.011 358	0.004 226	0.002 337	0.001 193	0.001 193	0.001 285	0.001 193	0.001 285
DCP14	-0.140	0.269	0.077 40	0.006 218	0.004 9	0.008 351	0.004 251	0.007 18	0.003 108	0.003 108	0.005 13	0.003 108	0.005 13
DCP15	-0.150	0.115	0.047 49	0.005 217	0.008 48	0.009 315	0.002 57	0.006 312	0.001 251	0.001 251	0.011 25	0.001 251	0.011 25
DCP16	-0.160	-0.067	0.018 62	0.005 247	0.006 310	0.015 333	0.005 233	0.009 268	0.003 232	0.003 232	0.009 26	0.003 232	0.009 26
DCP17	-0.170	-0.033	0.012 164	0.011 247	0.011 34	0.001 228	0.007 349	0.007 359	0.005 76	0.005 76	0.010 156	0.005 76	0.010 156

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	Z/C	FORCED PITCHING OSCILLATION				AIRFOIL				NLR 1	TEST POINT 12000.0	CYCLES ANALYSED	
		TUNED MZ 0.0	DRIVE MZ 45.51	K 0.228	NACH NO 0.300	DEL-ALPHA 2.71	DEL-M 0.0	ALPHA-0 19.00	TEST POINT 12000.0			EXT DAMP 0.0	
ALPHA CH DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI			
	19.091	2.713 0	0.040 331	0.075 160	0.029 167	0.028 399	0.009 344	0.015 109	0.013 154	0.010 346			
	1.018	0.114 66	0.013 118	0.031 72	0.003 351	0.014 293	0.006 331	0.004 356	0.003 282	0.002 195			
	-0.097	0.075 233	0.010 252	0.008 202	0.003 186	0.004 86	0.003 125	0.001 131	0.001 29	0.001 247			
	2.070	1.342 136	0.203 265	0.105 213	0.054 314	0.017 41	0.015 199	0.015 54	0.019 200	0.004 311			
	2.248	0.732 171	0.311 306	0.101 80	0.052 330	0.086 107	0.064 218	0.026 134	0.056 263	0.050 18			
	0.350	0.333 120	0.095 246	0.035 27	0.021 18	0.010 181	0.044 262	0.018 315	0.004 348	0.008 121			
	-0.044	2.630	0.608 140	0.079 218	0.033 195	0.050 280	0.026 318	0.011 70	0.021 395	0.013 323			
	-0.074	2.165	0.443 122	0.062 210	0.033 103	0.015 347	0.013 356	0.010 49	0.013 278	0.012 236			
	-0.094	1.879	0.398 105	0.042 102	0.006 111	0.017 338	0.003 45	0.008 40	0.011 278	0.014 214			
	-1.449	1.600	0.343 88	0.073 121	0.048 85	0.014 156	0.007 340	0.008 117	0.009 336	0.005 172			
	-1.409	0.343 100	0.097 133	0.042 140	0.014 156	0.007 242	0.003 169	0.007 140	0.004 131	0.002 85			
	-0.250	1.290	0.360 97	0.050 135	0.146 112	0.021 220	0.003 291	0.009 236	0.020 33	0.021 178			
	-0.300	1.223	0.196 93	0.051 148	0.158 100	0.042 208	0.019 314	0.016 115	0.011 316	0.012 108			
	-0.399	1.124	0.427 89	0.069 130	0.047 92	0.019 175	0.030 137	0.026 57	0.013 346	0.012 71			
	-0.501	0.977	0.715 78	0.078 110	0.068 70	0.019 107	0.034 307	0.028 28	0.008 228	0.007 10			
	-0.609	0.808	0.401 70	0.054 62	0.052 46	0.020 53	0.030 275	0.025 292	0.005 65	0.005 174			
-0.701	0.745	0.381 60	0.048 43	0.042 16	0.024 7	0.016 248	0.025 279	0.007 28	0.013 201				
-0.800	0.586	0.308 51	0.036 30	0.031 341	0.030 338	0.012 240	0.029 237	0.006 324	0.006 244				
-0.900	0.263	0.195 45	0.017 157	0.023 347	0.017 363	0.007 211	0.009 231	0.007 215	0.010 230				
-0.949	0.061	0.084 54	0.002 137	0.009 351	0.006 301	0.016 209	0.019 227	0.008 343	0.010 237				

HARMONIC ANALYSIS

DATA TYPE	Z/C	FORCED PITCHING OSCILLATION				AIRFOIL NLR 1				TEST POINT 12000.0	CYCLES ANALYSED	
		TUNED MZ 0.0	DRIVE MZ 45.51	K 0.228	NACH NO 0.300	DEL-ALPHA 2.71	DEL-M 0.0	ALPHA-0 18.05	TEST POINT 12000.0		TEST POINT 12000.0	TEST POINT 12000.0
ALPHA												
CH												
DCP 1	-0.10	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	
DCP 2	-0.20	19.091	2.713 0	0.040 331	0.075 160	0.029 167	0.028 399	0.009 344	0.015 109	0.013 154	0.010 346	
DCP 3	-0.30	1.018	0.114 66	0.013 118	0.031 72	0.003 351	0.014 293	0.006 331	0.004 356	0.003 282	0.002 195	
DCP 4	-0.40	-0.097	0.075 233	0.010 252	0.008 202	0.003 186	0.004 86	0.003 125	0.001 131	0.001 29	0.001 247	
DCP 5	-0.50											
DCP 6	-0.60											
DCP 7	-0.70											
DCP 8	-0.80											
DCP 9	-0.90											
DCP 10	-1.00											
DCP 11	-1.10											
DCP 12	-1.20											
DCP 13	-1.30											
DCP 14	-1.40											
DCP 15	-1.50											
DCP 16	-1.60											
DCP 17	-1.70											

HARMONIC ANALYSIS

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

SOURCE SWITCHING OSCILLATION									
TUNED FZ	PHASE FZ	K	WAVE NO	DEL ALPH	DEL M	ALPHA 0	TEST POINT	CYCLES ANALYSED	
V	Q	PH	CHARGE	CHARGE	ALPHA MAX	ASPT DAMP	TOR	EXP DAMP	
105.8 (347.2)	28666 (598.7)	0.400 07	-0.035	0.520	5.40	-0.0070	0.699	0.0	
TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	2.400	3.109 0	0.115 112	0.304 194	0.727 98	0.021 216	0.011 64	0.015 44	0.071 221
PH	-0.014	0.145 14	0.004 17	0.006 119	0.001 150	0.003 246	0.002 141	0.004 172	0.004 216
PH 1		0.020 298	0.002 275	0.002 191	0.001 278	0.001 135	0.001 14	0.001 348	0.001 113
PH 2	0.547	1.242 243	0.040 142	0.040 274	0.032 149	0.022 140	0.046 27	0.018 17	0.014 178
PH 3	0.010	1.757 257	0.041 196	0.016 231	0.006 117	0.012 210	0.015 14	0.014 31	0.014 174
PH 4	0.049	0.044 142	0.024 311	0.010 214	0.002 122	0.012 206	0.004 16	0.004 714	0.005 146
PH 5	0.049	0.717 253	0.020 311	0.013 215	0.003 72	0.017 200	0.004 145	0.006 92	0.005 143
PH 6	0.049	0.482 254	0.024 321	0.011 267	0.009 163	0.032 277	0.002 48	0.003 329	0.004 124
PH 7	0.049	0.477 254	0.024 342	0.017 264	0.016 185	0.004 291	0.002 327	0.004 76	0.002 352
PH 8	0.049	0.477 254	0.011 311	0.011 256	0.007 83	0.005 80	0.008 171	0.004 68	0.005 260
PH 9	0.049	0.477 254	0.007 318	0.004 317	0.003 23	0.005 324	0.007 103	0.010 199	0.005 244
PH 10	0.049	0.477 254	0.001 314	0.001 314	0.003 127	0.001 137	0.007 103	0.005 107	0.003 316
PH 11	0.049	0.477 254	0.003 322	0.009 322	0.014 265	0.007 317	0.021 10	0.024 285	0.032 294
PH 12	0.049	0.477 254	0.012 34	0.007 314	0.002 131	0.014 290	0.005 178	0.004 148	0.006 78
PH 13	0.049	0.477 254	0.020 18	0.027 314	0.002 163	0.013 317	0.005 163	0.007 194	0.004 48
PH 14	0.049	0.477 254	0.012 92	0.010 36	0.006 194	0.010 306	0.006 272	0.007 128	0.004 33
PH 15	0.049	0.477 254	0.004 35	0.013 144	0.004 207	0.008 342	0.003 284	0.007 128	0.003 110
PH 16	0.049	0.477 254	0.007 395	0.006 149	0.004 2	0.007 291	0.008 244	0.004 73	0.007 90
PH 17	0.049	0.477 254	0.002 44	0.007 304	0.005 221	0.003 121	0.007 59	0.004 32	0.011 308

SOURCE SWITCHING OSCILLATION									
TUNED FZ	PHASE FZ	K	WAVE NO	DEL ALPH	DEL M	ALPHA 0	TEST POINT	CYCLES ANALYSED	
V	Q	PH	CHARGE	CHARGE	ALPHA MAX	ASPT DAMP	TOR	EXP DAMP	
103.2 (338.6)	27435 (573.0)	0.449 07	-0.034	0.784	7.98	-0.0087	0.761	0.0	
TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	4.980	3.117 0	0.121 304	0.088 198	0.015 96	0.021 284	0.040 47	0.002 118	0.004 255
PH	-0.012	0.143 14	0.013 354	0.005 275	0.001 257	0.006 7	0.004 119	0.001 32	0.002 294
PH 1		0.023 290	0.002 220	0.001 114	0.000 324	0.002 185	0.001 200	0.000 281	0.000 161
PH 2	1.756	1.222 242	0.045 324	0.033 261	0.032 224	0.016 94	0.010 128	0.014 349	0.019 343
PH 3	0.010	1.072 241	0.046 190	0.016 198	0.007 121	0.005 142	0.006 92	0.004 396	0.002 244
PH 4	0.010	0.044 142	0.024 311	0.010 214	0.002 122	0.012 206	0.004 16	0.004 714	0.005 146
PH 5	0.010	0.717 253	0.020 311	0.013 215	0.003 72	0.017 200	0.004 145	0.006 92	0.005 143
PH 6	0.010	0.482 254	0.024 321	0.011 267	0.009 163	0.032 277	0.002 48	0.003 329	0.004 124
PH 7	0.010	0.477 254	0.024 342	0.017 264	0.016 185	0.004 291	0.002 327	0.004 76	0.002 352
PH 8	0.010	0.477 254	0.011 311	0.011 256	0.007 83	0.005 80	0.008 171	0.004 68	0.005 260
PH 9	0.010	0.477 254	0.007 318	0.004 317	0.003 23	0.005 324	0.007 103	0.010 199	0.005 244
PH 10	0.010	0.477 254	0.001 314	0.001 314	0.003 127	0.001 137	0.007 103	0.005 107	0.003 316
PH 11	0.010	0.477 254	0.003 322	0.009 322	0.014 265	0.007 317	0.021 10	0.024 285	0.032 294
PH 12	0.010	0.477 254	0.012 34	0.007 314	0.002 131	0.014 290	0.005 178	0.004 148	0.006 78
PH 13	0.010	0.477 254	0.020 18	0.027 314	0.002 163	0.013 317	0.005 163	0.007 194	0.004 48
PH 14	0.010	0.477 254	0.012 92	0.010 36	0.006 194	0.010 306	0.006 272	0.007 128	0.004 33
PH 15	0.010	0.477 254	0.004 35	0.013 144	0.004 207	0.008 342	0.003 284	0.007 128	0.003 110
PH 16	0.010	0.477 254	0.007 395	0.006 149	0.004 2	0.007 291	0.008 244	0.004 73	0.007 90
PH 17	0.010	0.477 254	0.002 44	0.007 304	0.005 221	0.003 121	0.007 59	0.004 32	0.011 308

SOURCE SWITCHING OSCILLATION

ALPHA 0

SOURCE SWITCHING OSCILLATION

ALPHA 0

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DATE	TIME	SOLAR POSITION				SOLAR DISTANCE				SOLAR VELOCITY				SOLAR ACCELERATION			
		DEC. 1	DEC. 2	DEC. 3	DEC. 4	DEC. 5	DEC. 6	DEC. 7	DEC. 8	DEC. 9	DEC. 10	DEC. 11	DEC. 12	DEC. 13	DEC. 14	DEC. 15	
1900.0	100.6	10.014	0.012	0.010	0.008	0.006	0.004	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1900.1	100.7	10.015	0.013	0.011	0.009	0.007	0.005	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	
1900.2	100.8	10.016	0.014	0.012	0.010	0.008	0.006	0.004	0.003	0.002	0.001	0.000	0.000	0.000	0.000	0.000	
1900.3	100.9	10.017	0.015	0.013	0.011	0.009	0.007	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000	0.000	
1900.4	101.0	10.018	0.016	0.014	0.012	0.010	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000	0.000	
1900.5	101.1	10.019	0.017	0.015	0.013	0.011	0.009	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000	0.000	
1900.6	101.2	10.020	0.018	0.016	0.014	0.012	0.010	0.008	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000	
1900.7	101.3	10.021	0.019	0.017	0.015	0.013	0.011	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.002	0.001	
1900.8	101.4	10.022	0.020	0.018	0.016	0.014	0.012	0.010	0.009	0.008	0.007	0.006	0.005	0.004	0.003	0.002	
1900.9	101.5	10.023	0.021	0.019	0.017	0.015	0.013	0.011	0.010	0.009	0.008	0.007	0.006	0.005	0.004	0.003	
1901.0	101.6	10.024	0.022	0.020	0.018	0.016	0.014	0.012	0.011	0.010	0.009	0.008	0.007	0.006	0.005	0.004	
1901.1	101.7	10.025	0.023	0.021	0.019	0.017	0.015	0.013	0.012	0.011	0.010	0.009	0.008	0.007	0.006	0.005	
1901.2	101.8	10.026	0.024	0.022	0.020	0.018	0.016	0.014	0.013	0.012	0.011	0.010	0.009	0.008	0.007	0.006	
1901.3	101.9	10.027	0.025	0.023	0.021	0.019	0.017	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.008	0.007	
1901.4	102.0	10.028	0.026	0.024	0.022	0.020	0.018	0.016	0.015	0.014	0.013	0.012	0.011	0.010	0.009	0.008	
1901.5	102.1	10.029	0.027	0.025	0.023	0.021	0.019	0.017	0.016	0.015	0.014	0.013	0.012	0.011	0.010	0.009	
1901.6	102.2	10.030	0.028	0.026	0.024	0.022	0.020	0.018	0.017	0.016	0.015	0.014	0.013	0.012	0.011	0.010	
1901.7	102.3	10.031	0.029	0.027	0.025	0.023	0.021	0.019	0.018	0.017	0.016	0.015	0.014	0.013	0.012	0.011	
1901.8	102.4	10.032	0.030	0.028	0.026	0.024	0.022	0.020	0.019	0.018	0.017	0.016	0.015	0.014	0.013	0.012	
1901.9	102.5	10.033	0.031	0.029	0.027	0.025	0.023	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.014	0.013	
1902.0	102.6	10.034	0.032	0.030	0.028	0.026	0.024	0.022	0.021	0.020	0.019	0.018	0.017	0.016	0.015	0.014	
1902.1	102.7	10.035	0.033	0.031	0.029	0.027	0.025	0.023	0.022	0.021	0.020	0.019	0.018	0.017	0.016	0.015	

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FORCED PITCHING OSCILLATION									
DATA TYPE	YUMEN MZ	ACTIVE MZ	K	WACH WD	DEL.M	ALPHA.0	TEST DTIME	CYCLES ANALYSIS	PER RAMP
ALPHA	0.0	23.12	0.007	0.400	0.0	4.00	12103.3	20	0.0
CM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DCP 1	2.727	1.642 347	0.050 279	0.026 145	0.003 49	0.003 227	0.004 140	0.000 166	0.002 113
DCP 2	2.234	1.295 350	0.022 327	0.007 114	0.003 740	0.003 161	0.002 152	0.000 152	0.002 24
DCP 3	2.126	1.084 350	0.018 356	0.004 148	0.003 102	0.003 150	0.004 147	0.000 152	0.002 24
DCP 4	1.977	0.923 350	0.015 333	0.001 255	0.001 156	0.001 210	0.004 147	0.000 152	0.002 24
DCP 5	1.763	0.732 350	0.012 351	0.004 314	0.001 70	0.002 255	0.003 11	0.000 152	0.002 194
DCP 6	1.607	0.603 351	0.009 8	0.004 112	0.001 183	0.001 226	0.002 104	0.000 152	0.002 182
DCP 7	1.459	0.444 351	0.014 26	0.004 114	0.003 734	0.004 243	0.001 104	0.000 152	0.002 182
DCP 8	1.300	0.307 354	0.007 12	0.002 349	0.002 194	0.004 335	0.000 126	0.000 152	0.002 182
DCP 9	1.149	0.149 354	0.007 48	0.002 31	0.001 115	0.002 223	0.000 126	0.000 152	0.002 182
DCP 10	0.993	0.093 355	0.007 48	0.002 343	0.001 93	0.002 294	0.000 126	0.000 152	0.002 182
DCP 11	0.843	0.043 359	0.006 39	0.003 304	0.003 308	0.003 187	0.001 10	0.000 152	0.002 182
DCP 12	0.693	0.093 360	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 13	0.543	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 14	0.393	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 15	0.243	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 16	0.093	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 17	0.000	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182

FORCED PITCHING OSCILLATION									
DATA TYPE	YUMEN MZ	ACTIVE MZ	K	WACH WD	DEL.M	ALPHA.0	TEST DTIME	CYCLES ANALYSIS	PER RAMP
ALPHA	0.0	23.01	0.008	0.300	0.0	7.19	12103.4	20	0.0
CM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DCP 1	2.727	1.642 347	0.050 279	0.026 145	0.003 49	0.003 227	0.004 140	0.000 166	0.002 113
DCP 2	2.234	1.295 350	0.022 327	0.007 114	0.003 740	0.003 161	0.002 152	0.000 152	0.002 24
DCP 3	2.126	1.084 350	0.018 356	0.004 148	0.003 102	0.003 150	0.004 147	0.000 152	0.002 24
DCP 4	1.977	0.923 350	0.015 333	0.001 255	0.001 156	0.001 210	0.004 147	0.000 152	0.002 24
DCP 5	1.763	0.732 350	0.012 351	0.004 314	0.001 70	0.002 255	0.003 11	0.000 152	0.002 194
DCP 6	1.607	0.603 351	0.009 8	0.004 112	0.001 183	0.001 226	0.002 104	0.000 152	0.002 182
DCP 7	1.459	0.444 351	0.014 26	0.004 114	0.003 734	0.004 243	0.001 104	0.000 152	0.002 182
DCP 8	1.300	0.307 354	0.007 12	0.002 349	0.002 194	0.004 335	0.000 126	0.000 152	0.002 182
DCP 9	1.149	0.149 354	0.007 48	0.002 31	0.001 115	0.002 223	0.000 126	0.000 152	0.002 182
DCP 10	0.993	0.093 355	0.007 48	0.002 343	0.001 93	0.002 294	0.000 126	0.000 152	0.002 182
DCP 11	0.843	0.043 359	0.006 39	0.003 304	0.003 308	0.003 187	0.001 10	0.000 152	0.002 182
DCP 12	0.693	0.043 360	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 13	0.543	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 14	0.393	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 15	0.243	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 16	0.093	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182
DCP 17	0.000	0.043 361	0.006 39	0.003 304	0.001 81	0.001 37	0.001 265	0.000 152	0.002 182

DATA TYPE	FORCED PITCHING OSCILLATION					ATLANTIC			NLR 1			CYCLES ANALYSIS				
	TURNED W/ 7.0	NATIVE W/ 45.62	K 0.173	WCM W/ 0.394	DEL. ALPHA 2.65	DEL. M 0.0	DEL. ALPHA 2.65	DEL. M 0.0	DEL. ALPHA 2.65	DEL. M 0.0	TEST ONLY 12100.2	700	PIT RAMP 1.522	PES 7 PMF	PES 8 PMF	PES 9 PMF
Y 134.6 (441.6)	0 47009.8 (981.8)	0.437 07	-0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141	0.141
HARMONIC ANALYSIS																
REC	PES 0	PES 1 PMF	PES 2 PMF	PES 3 PMF	PES 4 PMF	PES 5 PMF	PES 6 PMF	PES 7 PMF	PES 8 PMF	PES 9 PMF	PES 10 PMF	PES 11 PMF	PES 12 PMF	PES 13 PMF	PES 14 PMF	PES 15 PMF
REC 0	14.005	2.051 0	0.012 141	0.001 121	0.031 41	0.032 7	0.043 133	2.022 145	0.003 170	0.017 323	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190
REC 1	1.020	2.340 78	0.075 06	0.073 47	0.010 19	0.005 12	0.005 1	0.007 67	0.009 18	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190
REC 2	-0.041	0.700 100	0.023 187	0.014 162	0.010 159	0.002 120	0.002 159	0.001 75	0.002 184	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190	0.001 190
REC 3	4.445	1.391 171	0.798 249	0.123 120	0.069 41	0.003 07	0.029 74	0.030 156	0.022 200	0.022 200	0.022 200	0.022 200	0.022 200	0.022 200	0.022 200	0.022 200
REC 4	3.017	1.155 157	0.360 130	0.091 120	0.077 57	0.059 34	0.031 126	0.044 140	0.034 120	0.034 120	0.034 120	0.034 120	0.034 120	0.034 120	0.034 120	0.034 120
REC 5	0.93	3.347	0.939 169	0.174 140	0.126 160	0.057 283	0.022 17	0.030 43	0.029 17	0.029 17	0.029 17	0.029 17	0.029 17	0.029 17	0.029 17	0.029 17
REC 6	0.60	2.020	0.795 164	0.153 159	0.100 167	0.047 275	0.022 44	0.046 38	0.038 12	0.038 12	0.038 12	0.038 12	0.038 12	0.038 12	0.038 12	0.038 12
REC 7	0.74	2.610	0.777 133	0.153 127	0.137 130	0.045 165	0.012 171	0.031 136	0.030 62	0.030 62	0.030 62	0.030 62	0.030 62	0.030 62	0.030 62	0.030 62
REC 8	-0.99	2.157	0.670 121	0.140 130	0.115 114	0.035 188	0.015 194	0.031 81	0.018 18	0.018 18	0.018 18	0.018 18	0.018 18	0.018 18	0.018 18	0.018 18
REC 9	1.140	0.453 94	0.187 128	0.109 107	0.067 152	0.017 79	0.015 327	0.020 307	0.020 334	0.020 334	0.020 334	0.020 334	0.020 334	0.020 334	0.020 334	0.020 334
REC 10	0.260	1.306	0.443 77	0.097 102	0.064 117	0.011 05	0.006 325	0.026 235	0.014 14	0.014 14	0.014 14	0.014 14	0.014 14	0.014 14	0.014 14	0.014 14
REC 11	0.369	1.353	0.404 77	0.073 43	0.064 64	0.017 120	0.007 324	0.030 751	0.009 149	0.009 149	0.009 149	0.009 149	0.009 149	0.009 149	0.009 149	0.009 149
REC 12	0.501	1.214	1.301 61	0.060 59	0.036 70	0.015 61	0.015 166	0.010 150	0.010 121	0.010 121	0.010 121	0.010 121	0.010 121	0.010 121	0.010 121	0.010 121
REC 13	0.952	0.942	0.330 47	0.064 24	0.046 5	0.010 24	0.015 8	0.006 161	0.011 23	0.011 23	0.011 23	0.011 23	0.011 23	0.011 23	0.011 23	0.011 23
REC 14	0.676	0.295 41	0.000 56	0.064 10	0.040 1	0.010 351	0.004 18	0.006 161	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345
REC 15	0.701	0.272 20	0.005 1	0.064 310	0.036 323	0.014 313	0.013 311	0.002 273	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345
REC 16	0.800	0.792 21	0.077 354	0.042 332	0.036 332	0.018 290	0.010 244	0.004 161	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345
REC 17	0.800	0.146 27	0.066 55	0.046 310	0.036 300	0.013 241	0.000 290	0.004 161	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345	0.017 345
REC 18	0.028	2.795 27	0.037 5	0.023 313	0.021 336	0.003 276	0.009 17	1.006 172	0.006 33	0.006 33	0.006 33	0.006 33	0.006 33	0.006 33	0.006 33	0.006 33

103

FREE PITCHING OSCILLATION									
DATA TYPE	K/C	TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL H	ALPHA	RES
ALPHA		7.0	45.65	0.174	0.309	2.67	0.0	17.36	12100.2
CM				0.0	0.0	0.0	0.0	0.0	0.0
DCP 1	-0.10	133.6	46477.	0.63E 07	-0.130	1.264	17.63	-0.00230	2.414
DCP 2	-0.20	(438.4)	(970.7)						
DCP 3	-0.30								
DCP 4	-0.40								
DCP 5	-0.50								
DCP 6	-0.60								
DCP 7	-0.70								
DCP 8	-0.80								
DCP 9	-0.90								
DCP 10	-1.00								
DCP 11	-1.10								
DCP 12	-1.20								
DCP 13	-1.30								
DCP 14	-1.40								
DCP 15	-1.50								
DCP 16	-1.60								
DCP 17	-1.70								

FREE PITCHING OSCILLATION									
DATA TYPE	K/C	TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL H	ALPHA	RES
ALPHA		7.0	45.65	0.174	0.309	2.67	0.0	17.36	12100.2
CM				0.0	0.0	0.0	0.0	0.0	0.0
DCP 1	-0.10	133.6	46477.	0.63E 07	-0.130	1.264	17.63	-0.00230	2.414
DCP 2	-0.20	(438.4)	(970.7)						
DCP 3	-0.30								
DCP 4	-0.40								
DCP 5	-0.50								
DCP 6	-0.60								
DCP 7	-0.70								
DCP 8	-0.80								
DCP 9	-0.90								
DCP 10	-1.00								
DCP 11	-1.10								
DCP 12	-1.20								
DCP 13	-1.30								
DCP 14	-1.40								
DCP 15	-1.50								
DCP 16	-1.60								
DCP 17	-1.70								

FORCED PITCHING OSCILLATION									
DATA TYPE	K/C	TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL H	ALPHA	RES
ALPHA		7.0	45.65	0.174	0.309	2.67	0.0	17.36	12100.2
CM				0.0	0.0	0.0	0.0	0.0	0.0
DCP 1	-0.10	133.6	45927.	0.63E 07	-0.130	1.264	17.63	-0.00230	2.414
DCP 2	-0.20	(435.2)	(959.2)						
DCP 3	-0.30								
DCP 4	-0.40								
DCP 5	-0.50								
DCP 6	-0.60								
DCP 7	-0.70								
DCP 8	-0.80								
DCP 9	-0.90								
DCP 10	-1.00								
DCP 11	-1.10								
DCP 12	-1.20								
DCP 13	-1.30								
DCP 14	-1.40								
DCP 15	-1.50								
DCP 16	-1.60								
DCP 17	-1.70								

SPECTROMETER OSCILLATION									
ALPHA									
DATA TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	17.570	2.515	0.000	0.019	0.009	0.017	0.005	0.014	0.004
PH	1.004	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 3	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 4	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 6	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 7	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 9	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 10	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 11	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 12	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 13	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 14	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 15	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 16	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 17	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

SPECTROMETER OSCILLATION									
ALPHA									
DATA TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	17.570	2.515	0.000	0.019	0.009	0.017	0.005	0.014	0.004
PH	1.004	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 2	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 3	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 4	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 6	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 7	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 8	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 9	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 10	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 11	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 12	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 13	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 14	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 15	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 16	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
RES 17	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WAVE NO	DELTA	ALPHA-0	TEST POINT	CYCLES ANALYSIS		
0.0	45.53	0.137	0.505	0.0	2.47	12110.3	20	EXT RAMP	0.0
HARMONIC ANALYSIS									
DATA TYPE	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI
ALPHA	2.473	2.824	0	0.074	0.038	0.076	0.017	0.018	0.021
CM	0.394	0.254	0.353	0.005	0.004	0.001	0.001	0.001	0.001
CM	-0.011	0.011	0.011	0.001	0.000	0.000	0.000	0.001	0.001
DCP 1	0.007	1.587	0.341	0.044	0.012	0.012	0.002	0.005	0.018
DCP 2	0.074	1.314	0.346	0.020	0.015	0.015	0.004	0.003	0.003
DCP 3	1.059	1.133	0.346	0.020	0.015	0.015	0.004	0.003	0.003
DCP 4	1.175	0.984	0.346	0.021	0.015	0.015	0.004	0.003	0.003
DCP 5	0.046	0.782	0.347	0.015	0.015	0.015	0.004	0.003	0.003
DCP 6	1.084	0.661	0.348	0.010	0.015	0.015	0.004	0.003	0.003
DCP 7	0.149	0.473	0.349	0.011	0.015	0.015	0.004	0.003	0.003
DCP 8	0.200	0.416	0.350	0.011	0.015	0.015	0.004	0.003	0.003
DCP 9	0.250	0.354	0.352	0.008	0.015	0.015	0.004	0.003	0.003
DCP 10	0.300	0.276	0.353	0.007	0.015	0.015	0.004	0.003	0.003
DCP 11	0.350	0.200	0.353	0.005	0.015	0.015	0.004	0.003	0.003
DCP 12	0.400	0.126	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 13	0.450	0.074	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 14	0.500	0.024	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 15	0.550	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 16	0.600	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 17	0.650	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WAVE NO	DELTA	ALPHA-0	TEST POINT	CYCLES ANALYSIS		
0.0	45.53	0.137	0.505	0.0	2.47	12110.3	20	EXT RAMP	0.0
HARMONIC ANALYSIS									
DATA TYPE	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI
ALPHA	2.473	2.824	0	0.074	0.038	0.076	0.017	0.018	0.021
CM	0.394	0.254	0.353	0.005	0.004	0.001	0.001	0.001	0.001
CM	-0.011	0.011	0.011	0.001	0.000	0.000	0.000	0.001	0.001
DCP 1	0.007	1.587	0.341	0.044	0.012	0.012	0.002	0.005	0.018
DCP 2	0.074	1.314	0.346	0.020	0.015	0.015	0.004	0.003	0.003
DCP 3	1.059	1.133	0.346	0.020	0.015	0.015	0.004	0.003	0.003
DCP 4	1.175	0.984	0.346	0.021	0.015	0.015	0.004	0.003	0.003
DCP 5	0.046	0.782	0.347	0.015	0.015	0.015	0.004	0.003	0.003
DCP 6	1.084	0.661	0.348	0.010	0.015	0.015	0.004	0.003	0.003
DCP 7	0.149	0.473	0.349	0.011	0.015	0.015	0.004	0.003	0.003
DCP 8	0.200	0.416	0.350	0.011	0.015	0.015	0.004	0.003	0.003
DCP 9	0.250	0.354	0.352	0.008	0.015	0.015	0.004	0.003	0.003
DCP 10	0.300	0.276	0.353	0.007	0.015	0.015	0.004	0.003	0.003
DCP 11	0.350	0.200	0.353	0.005	0.015	0.015	0.004	0.003	0.003
DCP 12	0.400	0.126	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 13	0.450	0.074	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 14	0.500	0.024	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 15	0.550	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 16	0.600	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003
DCP 17	0.650	0.000	0.353	0.003	0.015	0.015	0.004	0.003	0.003

FORCED PITCHING OSCILLATION									
TUNER FZ	K	WARM NO	REL. ALPHA	REL. H	ALPHA-0	TEST PMIN	TESTS ANALYSIS		
0.0	0.138	0.501	2.83	0.0	7.45	12110.4	27		
HARMONIC ANALYSIS									
DATA	R/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		2.870	0	0.090	0.089	0.015	0.017	0.010	0.005
CH		0.004	0.022	0.037	0.014	0.014	0.004	0.004	0.000
PM		0.010	0.022	0.037	0.014	0.014	0.004	0.004	0.000
DCP 1	0.010	1.180	0.349	0.424	0.151	0.096	0.040	0.047	0.008
DCP 2	0.020	1.464	0.595	0.208	0.237	0.109	0.086	0.070	0.061
DCP 3	0.030	1.475	0.594	0.066	0.224	0.109	0.086	0.070	0.061
DCP 4	0.040	1.063	0.2	0.214	0.253	0.120	0.097	0.081	0.077
DCP 5	0.050	2.658	0.697	0.13	0.273	0.142	0.103	0.081	0.081
DCP 6	0.060	2.259	0.498	0.126	0.108	0.207	0.071	0.033	0.021
DCP 7	0.070	1.661	0.362	0.100	0.050	0.325	0.039	0.021	0.011
DCP 8	0.080	1.707	0.411	0.117	0.089	0.148	0.052	0.034	0.021
DCP 9	0.090	1.227	0.380	0.117	0.117	0.117	0.081	0.034	0.021
DCP 10	0.100	1.037	0.288	0.117	0.117	0.117	0.081	0.034	0.021
DCP 11	0.110	0.821	0.194	0.117	0.117	0.117	0.081	0.034	0.021
DCP 12	0.120	0.619	0.143	0.117	0.117	0.117	0.081	0.034	0.021
DCP 13	0.130	0.415	0.110	0.117	0.117	0.117	0.081	0.034	0.021
DCP 14	0.140	0.212	0.074	0.117	0.117	0.117	0.081	0.034	0.021
DCP 15	0.150	0.009	0.027	0.117	0.117	0.117	0.081	0.034	0.021
DCP 16	0.160	-0.009	0.027	0.117	0.117	0.117	0.081	0.034	0.021
DCP 17	0.170	-0.076	0.008	0.117	0.117	0.117	0.081	0.034	0.021

FORCED PITCHING OSCILLATION									
TUNER FZ	REL FZ	K	WARM NO	REL. ALPHA	REL. H	ALPHA-0	TEST PMIN	CYCLES ANALYSIS	
0.0	45.46	0.136	0.501	2.77	0.0	9.00	12121.1	20	
HARMONIC ANALYSIS									
V	CH	CH	CH	CH	ALPHA-0	DELTA-0	TEST	PMIN	
170.4 (159.0)	74880. (1563.9)	0.136	0.501	2.77	0.0	9.00	12121.1	20	
DATA	R/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		5.005	2.713	0	0.133	59	0.767	330	0.018
CH		0.074	0.198	75	0.043	10	0.026	294	0.010
PM		0.004	0.024	294	0.025	97	0.006	53	0.007
DCP 1	0.010	0.745	162	0.067	82	0.144	17	0.041	283
DCP 2	0.020	0.437	0.940	167	0.045	91	0.191	13	0.018
DCP 3	0.030	0.467	0.368	172	0.080	97	0.166	40	0.037
DCP 4	0.040	0.369	0.369	135	0.787	99	0.142	164	0.061
DCP 5	0.050	0.293	0.574	197	0.395	76	0.192	61	0.143
DCP 6	0.060	2.494	0.794	99	0.311	40	0.152	8	0.074
DCP 7	0.070	0.206	0.349	74	0.236	20	0.102	338	0.031
DCP 8	0.080	1.508	0.337	66	0.215	16	0.121	316	0.083
DCP 9	0.090	1.347	0.347	56	0.212	356	0.113	309	0.064
DCP 10	0.100	0.890	0.249	65	0.175	345	0.075	307	0.083
DCP 11	0.110	0.679	0.214	68	0.287	324	0.091	273	0.083
DCP 12	0.120	0.529	0.178	75	0.784	308	0.090	212	0.083
DCP 13	0.130	0.434	0.147	44	0.374	241	0.012	177	0.029
DCP 14	0.140	0.238	0.119	55	0.048	269	0.011	270	0.029
DCP 15	0.150	-0.014	0.068	18	0.042	263	0.017	164	0.017
DCP 16	0.160	-0.052	0.064	13	0.019	276	0.074	278	0.074
DCP 17	0.170	0.969	0.766	14	0.019	276	0.011	189	0.006
DCP 18	0.180	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 19	0.190	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 20	0.200	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 21	0.210	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 22	0.220	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 23	0.230	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 24	0.240	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 25	0.250	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 26	0.260	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 27	0.270	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 28	0.280	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 29	0.290	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 30	0.300	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 31	0.310	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 32	0.320	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 33	0.330	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 34	0.340	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 35	0.350	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 36	0.360	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 37	0.370	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 38	0.380	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 39	0.390	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 40	0.400	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 41	0.410	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 42	0.420	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 43	0.430	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 44	0.440	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 45	0.450	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 46	0.460	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 47	0.470	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 48	0.480	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 49	0.490	0.936	0.746	14	0.019	276	0.011	189	0.006
DCP 50	0.500	0.936	0.746	14	0.019	276	0.011	189	0.006

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

CONCENTRATION OSCILLATION									
TUNER MZ	DRIVE MZ	K	WPM NO	DEL.M	DEL.M	ALPHA.0	TEST POINT	CYCLES ANALYSED	
V	0	0.138	0.501	0.0	0.0	12.44	12121.2	20	0.0
168.1 (551.6)	73467. (1534.4)	0.796 07	0.069	1.315	11.05	-0.00176	2.446	0.0	0.0
DATA TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	12.444	2.638 0	0.048 348	0.128 174	0.043 116	0.057 243	0.007 50	0.018 275	0.005 180
CN	1.014	0.223 97	0.052 134	0.031 114	0.012 117	0.004 60	0.006 294	3.007 284	0.003 32
CM	-0.009	0.051 207	0.007 225	0.008 176	0.004 243	0.003 201	0.001 154	0.001 126	0.001 268
DCP 1	4.425	0.012 170	0.071 143	0.069 161	0.027 266	0.014 270	0.006 173	0.017 14	0.029 107
DCP 2	4.144	1.122 175	0.073 132	0.179 199	0.039 294	0.057 243	0.030 331	0.020 302	0.023 310
DCP 3	3.926	1.133 181	0.095 178	0.288 204	0.033 276	0.089 222	0.055 482	0.034 261	0.039 248
DCP 4	3.302	1.159 171	0.311 250	0.121 149	0.093 288	0.083 27	0.013 25	0.044 78	0.031 123
DCP 5	2.432	0.830 146	0.236 210	0.036 192	0.051 7	0.013 47	0.015 304	0.029 260	0.031 123
DCP 6	2.304	0.594 123	0.164 154	0.132 152	0.072 278	0.014 241	0.019 395	0.005 250	0.017 32
DCP 7	1.940	0.410 97	0.119 130	0.126 119	0.063 154	0.031 155	0.017 243	0.011 240	0.017 32
DCP 8	1.604	0.408 98	0.169 146	0.118 140	0.064 186	0.016 247	0.028 904	0.070 306	0.020 268
DCP 9	1.270	0.420 82	0.187 119	0.132 115	0.057 149	0.020 224	0.031 232	0.017 244	0.012 79
DCP10	1.090	0.345 76	0.140 120	0.098 114	0.039 147	0.028 168	0.016 236	0.012 237	0.008 336
DCP11	0.990	0.300 75	0.091 97	0.036 14	0.033 83	0.024 42	0.013 31	0.009 291	0.012 143
DCP12	0.801	0.244 67	0.051 97	0.036 14	0.033 83	0.024 42	0.013 31	0.009 291	0.012 143
DCP13	0.643	0.199 62	0.016 97	0.025 355	0.018 65	0.014 21	0.009 334	0.009 231	0.012 135
DCP14	0.443	0.148 55	0.009 259	0.023 344	0.014 23	0.017 330	0.009 334	0.009 231	0.012 135
DCP15	0.276	0.108 30	0.016 17	0.022 345	0.018 33	0.017 330	0.009 334	0.009 231	0.012 135
DCP16	0.095	0.129 21	0.032 30	0.011 343	0.004 385	0.008 3	0.003 268	0.006 209	0.007 100
DCP17	-0.018	0.054 24	0.020 45	0.011 46	0.006 12	0.004 276	0.002 250	0.006 316	0.005 46

CONCENTRATION OSCILLATION									
TUNER MZ	DRIVE MZ	K	WPM NO	DEL.M	DEL.M	ALPHA.0	TEST POINT	CYCLES ANALYSED	
V	0	0.139	0.498	0.0	0.0	14.09	12121.3	20	0.0
166.8 (547.2)	72539. (1515.0)	0.796 07	0.002	1.720	13.06	-0.00100	2.570	0.0	0.0
DATA TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	14.086	2.643 0	0.067 346	0.033 246	0.042 133	0.017 35	0.009 45	0.014 182	0.013 219
CN	1.006	0.167 89	0.036 135	0.019 220	0.011 177	0.003 150	0.002 372	0.001 103	0.001 281
CM	-0.047	0.045 213	0.011 251	0.002 308	0.002 296	0.002 276	0.001 11	0.009 40	0.001 220
DCP 1	3.733	0.209 158	0.072 201	0.069 350	0.006 227	0.008 348	0.007 89	0.018 71	0.013 80
DCP 2	3.474	0.456 155	0.114 203	0.011 115	0.010 161	0.020 354	0.009 123	0.023 187	0.017 88
DCP 3	3.242	0.716 173	0.293 259	0.132 340	0.034 154	0.040 274	0.031 20	0.010 192	0.021 233
DCP 4	2.446	0.623 154	0.104 210	0.040 272	0.027 187	0.007 201	0.002 51	0.010 198	0.009 316
DCP 5	2.178	0.481 145	0.092 191	0.042 248	0.040 179	0.004 236	0.020 17	0.010 78	0.024 304
DCP 6	1.904	0.389 137	0.084 185	0.042 240	0.039 203	0.023 164	0.008 251	0.008 88	0.012 244
DCP 7	1.731	0.288 115	0.104 159	0.058 240	0.032 233	0.017 312	0.011 28	0.012 177	0.009 255
DCP 8	1.517	0.229 110	0.095 168	0.058 240	0.032 233	0.017 312	0.011 28	0.012 177	0.009 255
DCP 9	1.432	0.231 99	0.085 160	0.052 230	0.021 235	0.012 277	0.011 233	0.012 171	0.009 277
DCP10	1.275	0.227 79	0.075 140	0.042 217	0.016 203	0.014 213	0.004 285	0.009 141	0.014 164
DCP11	1.084	0.228 79	0.043 120	0.027 187	0.014 153	0.027 192	0.012 233	0.011 255	0.015 16
DCP12	0.911	0.193 45	0.035 117	0.015 156	0.009 157	0.010 145	0.009 247	0.009 247	0.014 266
DCP13	0.680	0.173 45	0.042 107	0.014 151	0.012 180	0.021 121	0.009 246	0.009 164	0.012 142
DCP14	0.549	0.186 43	0.043 72	0.003 127	0.013 142	0.010 62	0.007 149	0.011 147	0.011 90
DCP15	0.378	0.173 38	0.037 56	0.003 195	0.010 114	0.000 49	0.002 787	0.004 224	0.005 43
DCP16	0.135	0.110 41	0.026 48	0.005 73	0.009 59	0.011 12	0.013 139	0.005 354	0.010 346
DCP17	0.016	0.047 48	0.018 46	0.004 123	0.006 181	0.003 160	0.006 155	0.005 46	0.001 268

FORCED PITCHING OSCILLATION									
ALPHA									
TUNER W/	DRIVE W/	WACH W/	REL. ALPHA	REL. M	ALPHA.0	TEST CENTER	CYCLES ANALYSED		
0.0	23.18	0.991	2.67	0.0	7.93	12127.6	20	EXP. RAMP	C.1
V	Q	0.948 07	1.065	0.50	-0.00166	7.768			
194.7	102478.								
(638.9)	(2140.3)								
MAGNETIC ANALYSIS									
DATA	SEC 0	SEC 1	SEC 2	SEC 3	SEC 4	SEC 5	SEC 6	SEC 7	SEC 8
TYPE	0	1	2	3	4	5	6	7	8
ALPHA	7.425	2.423	0.004	0.004	0.004	0.004	0.004	0.004	0.004
CM	0.018	0.015	0.005	0.005	0.005	0.005	0.005	0.005	0.005
SEC 1	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 2	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 3	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 4	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 5	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 6	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 8	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 9	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 10	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 11	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 12	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 13	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 14	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 15	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 16	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 17	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004

FORCED PITCHING OSCILLATION									
ALPHA									
TUNER W/	DRIVE W/	WACH W/	REL. ALPHA	REL. M	ALPHA.0	TEST CENTER	CYCLES ANALYSED		
0.0	23.18	0.991	2.67	0.0	7.93	12129.1	20	EXP. RAMP	C.1
V	Q	0.948 07	1.065	0.50	-0.00166	7.768			
196.7	103977.								
(645.4)	(2171.6)								
MAGNETIC ANALYSIS									
DATA	SEC 0	SEC 1	SEC 2	SEC 3	SEC 4	SEC 5	SEC 6	SEC 7	SEC 8
TYPE	0	1	2	3	4	5	6	7	8
ALPHA	7.425	2.423	0.004	0.004	0.004	0.004	0.004	0.004	0.004
CM	0.018	0.015	0.005	0.005	0.005	0.005	0.005	0.005	0.005
SEC 1	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 2	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 3	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 4	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 5	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 6	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 7	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 8	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 9	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 10	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 11	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 12	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 13	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 14	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 15	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 16	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
SEC 17	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004

REPRODUCIBILITY OF 100
ORIGINAL PAGE IS POOR

TYPE	X/C	TIME	W	EXPERIMENTAL OSCILLATION				ALPHA				TEST DATA				FURTHER ANALYSIS			
				K	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
196.9	104318.	45.77	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(646.2)	(2179.2)																		
195.7	103683.	45.57	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(642.4)	(2165.1)																		
196.9	104318.	45.77	0.118	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(646.2)	(2179.2)																		
195.7	103683.	45.57	0.110	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
(642.4)	(2165.1)																		

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible][illegible]

PROCED. RITCHING OSCILLATION AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL. ALPHA	DEL. H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.11	0.053	0.004	2.00	0.0	4.96	12101.3	20	
V	Q	PH	CHINAI	CHINAI	ALPHA-MAX	APPROX	TEST POINT	EXT DAMP	
223.7	128338.	0.106 00	-0.024	0.981	0.07	-0.00202	3.004	0.0	
(733.9)	(2680.4)								
HARMONIC ANALYSIS									
DATA TYPE	K/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA	4.963	2.599	0	0.072 39	0.044 206	0.053 97	0.034 29	0.075 279	0.041 177
CM	0.002	0.204 11	0.046 38	0.008 172	0.003 197	0.014 331	0.007 279	0.001 250	0.004 221
DCP 1	-0.10	1.541	0.024 354	0.120 23	0.011 25	0.011 236	0.009 100	0.011 204	0.004 204
DCP 2	-0.20	1.509	0.122 328	0.087 4	0.002 262	0.016 248	0.017 161	0.003 191	0.004 240
DCP 3	-0.30	1.492	0.610 358	0.076 353	0.011 208	0.016 233	0.016 151	0.003 19	0.002 236
DCP 4	-0.40	1.489	0.648 358	0.049 20	0.008 194	0.008 190	0.008 131	0.004 140	0.002 304
DCP 5	-0.74	1.781	0.531 358	0.049 28	0.005 174	0.008 212	0.005 134	0.004 131	0.002 328
DCP 6	-0.99	1.903	0.396 358	0.067 34	0.009 38	0.008 235	0.004 137	0.004 138	0.002 279
DCP 7	-1.48	1.880	0.346 357	0.062 34	0.012 24	0.004 237	0.004 133	0.004 139	0.002 279
DCP 8	-2.00	1.806	0.346 357	0.079 47	0.022 40	0.013 273	0.010 254	0.003 139	0.002 279
DCP 9	-2.50	1.737	0.328 352	0.454 40	0.157 115	0.020 193	0.008 254	0.027 215	0.045 250
DCP 10	-3.00	1.693	0.467 15	0.260 81	0.154 61	0.128 31	0.080 94	0.051 251	0.017 251
DCP 11	-3.99	0.721	0.316 11	0.017 456	0.009 359	0.046 7	0.041 222	0.009 947	0.005 225
DCP 12	-5.61	0.483	0.210 27	0.063 316	0.044 352	0.052 293	0.035 284	0.022 252	0.021 226
DCP 13	-6.00	0.348	0.795 57	0.046 343	0.020 243	0.031 265	0.027 216	0.018 196	0.022 184
DCP 14	-7.61	0.319	0.073 128	0.028 30	0.007 214	0.011 249	0.021 187	0.018 120	0.012 96
DCP 15	-8.00	0.1	0.044 114	0.025 25	0.005 260	0.004 244	0.010 180	0.018 115	0.008 80
DCP 16	-8.00	-0.118	0.026 70	0.022 348	0.005 287	0.010 248	0.015 154	0.018 116	0.007 72
DCP 17	-9.69	-0.091	0.015 159	0.010 95	0.003 124	0.004 294	0.002 143	0.002 39	0.002 187

FORCED PITCHING OSCILLATION AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL. ALPHA	DEL. H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.45	0.051	0.004	2.97	0.0	7.62	12103.1	20	
V	Q	PH	CHINAI	CHINAI	ALPHA-MAX	APPROX	TEST POINT	EXT DAMP	
225.3	129267.	0.106 00	-0.017	1.009	0.06	-0.00185	3.310	0.0	
(739.3)	(2699.8)								
HARMONIC ANALYSIS									
DATA TYPE	K/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA	7.423	2.975	0	0.096 28	0.041 220	0.018 83	0.017 328	0.007 181	0.014 210
CM	0.002	0.117 31	0.022 136	0.007 273	0.007 273	0.010 219	0.007 159	0.002 55	0.003 342
CM	-0.001	0.013 234	0.003 24	0.001 33	0.001 33	0.002 325	0.002 321	0.001 272	0.000 168
DCP 1	-0.10	2.147	0.376 350	0.076 64	0.008 27	0.009 100	0.019 0	0.004 74	0.010 251
DCP 2	-0.20	2.084	0.377 2	0.040 76	0.018 16	0.013 115	0.011 22	0.005 79	0.004 312
DCP 3	-0.30	2.000	0.541 2	0.025 71	0.024 8	0.011 116	0.013 13	0.004 71	0.004 322
DCP 4	-0.40	2.095	0.500 3	0.007 24	0.010 12	0.004 202	0.010 0	0.002 0	0.004 334
DCP 5	-0.74	2.134	0.344 3	0.007 23	0.002 26	0.004 194	0.007 19	0.001 324	0.003 333
DCP 6	-0.99	2.223	0.292 4	0.011 46	0.001 240	0.009 223	0.005 64	0.003 312	0.002 311
DCP 7	-1.49	2.129	0.197 8	0.044 72	0.011 331	0.020 227	0.010 120	0.007 34	0.004 314
DCP 8	-2.00	1.985	0.197 8	0.044 72	0.031 349	0.041 243	0.022 131	0.010 34	0.002 299
DCP 9	-2.50	1.632	0.263 140	0.040 200	0.060 113	0.049 225	0.020 110	0.020 136	0.002 259
DCP 10	-3.00	1.349	0.169 109	0.054 208	0.077 102	0.043 211	0.009 200	0.020 319	0.012 258
DCP 11	-3.99	0.972	0.117 33	0.050 194	0.031 217	0.032 237	0.011 173	0.009 255	0.007 132
DCP 12	-5.61	0.635	0.201 29	0.077 102	0.031 154	0.032 187	0.016 170	0.004 83	0.010 33
DCP 13	-6.00	0.430	0.156 27	0.021 122	0.012 126	0.026 155	0.011 146	0.003 106	0.009 311
DCP 14	-7.61	0.321	0.064 64	0.034 256	0.010 10	0.013 151	0.002 143	0.002 93	0.004 289
DCP 15	-8.00	0.141	0.033 33	0.031 247	0.008 36	0.013 74	0.002 60	0.002 42	0.002 33
DCP 16	-8.00	-0.094	0.003 25	0.002 328	0.002 328	0.004 144	0.005 127	0.002 117	0.002 184
DCP 17	-9.69	-0.092	0.013 49	0.002 215	0.000 308	0.003 95	0.000 174	0.000 225	0.002 172

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION					AIRFOIL					NLR 1		TEST POINT 1215.2	CYCLES ANALYSED												
		DRIVE M2 0.0		K 0.153		MACH NO 0.099		DEL-ALPHA 2.88		DEL-H 0.0		ALPHA-0 9.94			EXT DAMP 6.0												
		TUNED M2 0.0	Q 228.3 (749.1)	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI														
DCP 1 DCP 2 DCP 3 DCP 4 DCP 5 DCP 6 DCP 7 DCP 8 DCP 9 DCP 10 DCP 11 DCP 12 DCP 13 DCP 14 DCP 15 DCP 16 DCP 17	V 228.3 (749.1)	Q 128659. (2687.1)	0.10E 08	RN -0.042	CH(MIN) -0.042	CH(MAX) 1.190	HARMONIC ANALYSIS										TDR 2.107										
							RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI											
							9.939	2.885	0	0.194	15	0.015	170	0.051	103	0.019			23	0.003	186	0.007	137	0.024	141	0.007	315
							0.944	0.211	52	0.016	45	0.025	32	0.002	28	0.002			205	0.002	254	0.004	37	0.001	160	0.001	174
							-0.023	0.042	216	0.005	34	0.005	177	0.002	235	0.002			6	0.001	157	0.004	219	0.008	349	0.001	327
							0.097	0.491	356	0.058	80	0.007	120	0.005	246	0.007			336	0.001	155	0.004	24	0.002	47	0.001	104
							2.749	0.531	6	0.059	80	0.009	302	0.003	220	0.001			275	0.004	159	0.004	94	0.005	32	0.007	314
							0.030	2.322	0	0.124	73	0.023	300	0.011	192	0.004			111	0.006	67	0.005	342	0.002	194	0.002	262
							0.049	2.376	0	0.064	61	0.024	311	0.010	127	0.005			118	0.002	171	0.002	332	0.002	117	0.002	398
							0.074	2.308	0	0.130	44	0.046	298	0.003	80	0.007			200	0.001	151	0.002	156	0.004	76	0.002	50
0.059	2.248	0	0.176	38	0.026	323	0.040	349	0.024	236	0.007	188	0.010	145	0.004	42	0.001	136									
1.649	2.043	0	0.122	27	0.066	69	0.044	318	0.021	30	0.021	260	0.007	353	0.011	207	0.003	348									
0.200	1.422	0	0.064	5	0.098	94	0.017	246	0.039	43	0.007	226	0.013	356	0.010	346	0.014	270									
0.250	1.506	0	0.030	181	0.030	14	0.014	231	0.008	303	0.003	99	0.004	118	0.007	230	0.007	230									
0.399	1.263	0	0.035	63	0.049	64	0.009	246	0.008	277	0.015	223	0.004	161	0.008	177	0.013	167									
0.399	1.067	0	0.006	176	0.042	45	0.020	173	0.008	339	0.015	109	0.014	93	0.019	131	0.002	95									
0.501	0.813	0	0.034	152	0.052	32	0.013	96	0.003	72	0.003	227	0.010	24	0.019	113	0.011	135									
0.600	0.583	0	0.013	174	0.046	17	0.017	59	0.018	257	0.002	332	0.009	10	0.012	170	0.007	134									
0.600	0.435	0	0.224	27	0.023	328	0.005	108	0.017	167	0.003	12	0.006	84	0.004	112	0.004	204									
0.600	0.746	0	0.009	237	0.016	312	0.013	47	0.019	172	0.006	322	0.010	307	0.006	282	0.004	185									
0.900	-0.029	0	0.007	117	0.009	308	0.008	25	0.007	158	0.013	344	0.005	161	0.001	23	0.007	53									
0.949	-0.080	0	0.008	294	0.006	302	0.002	310	0.002	328	0.007	241	0.004	68	0.004	85	0.009	228									

FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1				CYCLES ANALYSED			
TUNED M2	DRIVE M2	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	TEST POINT	TEST POINT	ALPHA-0	DEL-H	ALPHA-0	TEST POINT	TEST POINT	TEST POINT	ALPHA-0	DEL-H	ALPHA-0	TEST POINT		
0.0	23-10	0.160	0.200	4.86	0.0	0.04	12001.1	0.799	0.0	0.04	0.0	0.04	0.799	0.0	0.0	0.04	0.0	0.04	0.0		
V	Q	BN	CINRMI	CINRAX	ALPHA-MAX	ARRO DAMP	TOR	EXT DAMP	0.0	ARRO DAMP	ALPHA-MAX	ARRO DAMP	TOR	EXT DAMP	0.0	ARRO DAMP	ALPHA-MAX	ARRO DAMP	TOR		
70.9	12009.	0.33E 07	-0.003	0.519	4.75	-0.00137	0.799	0.0	0.0	-0.00137	4.75	-0.00137	0.799	0.0	0.0	-0.00137	4.75	-0.00137	0.799		
(232.6)	(269.2)																				
HARMONIC ANALYSIS																					
Z/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16	RES 17	RES 18		
DEP 1	-0.439	2.072 346	0.170 23	0.031 82	0.011 204	0.012 279	0.010 147	0.007 252	0.010 302	0.007 344	0.008 344	0.009 344	0.010 344	0.011 344	0.012 344	0.013 344	0.014 344	0.015 344	0.016 344		
DEP 2	-0.430	2.092 349	0.081 347	0.011 65	0.008 244	0.009 232	0.007 167	0.009 256	0.010 276	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 3	0.000	0.149 349	0.009 344	0.001 123	0.002 107	0.003 249	0.017 144	0.003 9	0.008 265	0.006 313	0.008 313	0.009 313	0.010 313	0.011 313	0.012 313	0.013 313	0.014 313	0.015 313	0.016 313		
DEP 4	-0.034	1.411 350	0.049 342	0.005 14	0.004 107	0.007 260	0.010 185	0.005 357	0.007 277	0.008 313	0.009 313	0.010 313	0.011 313	0.012 313	0.013 313	0.014 313	0.015 313	0.016 313	0.017 313		
DEP 5	-0.177	1.143 350	0.041 345	0.010 349	0.005 64	0.003 279	0.014 178	0.005 357	0.007 277	0.008 313	0.009 313	0.010 313	0.011 313	0.012 313	0.013 313	0.014 313	0.015 313	0.016 313	0.017 313		
DEP 6	-0.394	0.970 352	0.032 358	0.010 356	0.012 64	0.001 136	0.007 200	0.010 359	0.010 273	0.007 273	0.008 313	0.009 313	0.010 313	0.011 313	0.012 313	0.013 313	0.014 313	0.015 313	0.016 313		
DEP 7	-1.449	0.730 355	0.032 18	0.012 7	0.012 34	0.005 79	0.009 153	0.011 350	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 8	-0.228	0.517 357	0.025 3	0.000 86	0.007 173	0.005 79	0.009 153	0.011 350	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 9	-0.148	0.437 358	0.020 23	0.000 46	0.006 100	0.004 332	0.007 236	0.009 322	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 10	-0.230	0.437 358	0.020 23	0.000 46	0.006 100	0.004 332	0.007 236	0.009 322	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 11	-0.399	0.244 3	0.016 45	0.000 108	0.003 149	0.004 332	0.007 236	0.009 322	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 12	-0.133	0.284 11	0.008 46	0.000 108	0.003 149	0.004 332	0.007 236	0.009 322	0.008 315	0.007 315	0.008 315	0.009 315	0.010 315	0.011 315	0.012 315	0.013 315	0.014 315	0.015 315	0.016 315		
DEP 13	-0.156	0.201 16	0.007 84	0.011 127	0.002 40	0.004 120	0.006 193	0.006 295	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 14	-0.209	0.156 20	0.014 108	0.003 64	0.006 103	0.012 352	0.005 318	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 15	-0.113	0.090 29	0.012 119	0.002 213	0.003 307	0.005 318	0.004 280	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 16	-0.072	0.032 81	0.009 121	0.000 8	0.008 203	0.007 194	0.004 239	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 17	-0.032	0.022 144	0.009 121	0.000 8	0.008 203	0.007 194	0.004 239	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 18	-0.012	0.022 144	0.009 121	0.000 8	0.008 203	0.007 194	0.004 239	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 19	-0.012	0.022 144	0.009 121	0.000 8	0.008 203	0.007 194	0.004 239	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		
DEP 20	-0.012	0.022 144	0.009 121	0.000 8	0.008 203	0.007 194	0.004 239	0.006 162	0.011 272	0.008 265	0.009 265	0.010 265	0.011 265	0.012 265	0.013 265	0.014 265	0.015 265	0.016 265	0.017 265		

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.96	0.174	0.197	4.81	0.0	17.44	12003.3	20	
V	Q	RN	CHIMINI	CHIMAX	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
67.1 (220.1)	11702. (244.4)	0.32E 07	-0.405	2.445	21.61	0.00045	-0.250	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		17.441	0.608	0	0.013 270	0.846 0	0.046 264	0.057 120	0.033 183
CN		1.328	0.647 55	0.186 345	0.111 303	0.129 235	0.099 143	0.048 56	0.016 328
CN		-0.078	0.125 180	0.045 99	0.044 47	0.041 351	0.036 270	0.021 185	0.008 124
DCP 1	-010	4.473	2.591 121	0.510 99	0.692 71	0.176 107	0.231 96	0.256 88	0.171 34
DCP 2	-020	3.987	2.345 110	0.606 83	0.559 55	0.150 332	0.114 105	0.114 105	0.062 65
DCP 3	-030	3.934	2.120 106	0.704 68	0.615 44	0.239 335	0.171 299	0.102 271	0.098 246
DCP 4	-040	3.421	1.945 109	0.804 60	0.317 21	0.233 325	0.145 235	0.098 99	0.050 334
DCP 5	-074	3.048	1.391 99	0.622 44	0.128 16	0.286 311	0.132 224	0.037 103	0.041 217
DCP 6	-099	2.810	1.273 90	0.491 41	0.155 10	0.307 287	0.140 222	0.016 165	0.036 254
DCP 7	-149	2.208	1.142 73	0.362 26	0.359 350	0.278 242	0.148 217	0.032 161	0.027 193
DCP 8	-200	1.980	1.012 66	0.368 25	0.332 340	0.284 290	0.148 229	0.045 195	0.064 230
DCP 9	-250	1.747	0.931 56	0.328 5	0.303 321	0.274 252	0.127 171	0.105 135	0.041 142
DCP10	-300	1.624	0.844 48	0.307 353	0.258 300	0.265 244	0.235 177	0.093 127	0.070 111
DCP11	-399	1.439	0.799 43	0.279 316	0.213 266	0.233 216	0.217 137	0.131 110	0.050 77
DCP12	-501	1.137	0.730 34	0.253 297	0.218 259	0.214 159	0.226 113	0.139 41	0.080 24
DCP13	-600	0.948	0.686 27	0.293 261	0.182 223	0.204 171	0.201 87	0.145 9	0.091 304
DCP14	-701	0.774	0.585 20	0.201 274	0.129 214	0.152 162	0.194 71	0.118 345	0.076 280
DCP15	-800	0.527	0.429 10	0.133 270	0.070 203	0.099 145	0.102 47	0.076 318	0.029 215
DCP16	-900	0.245	0.293 0	0.121 276	0.070 191	0.075 101	0.068 23	0.057 292	0.021 188
DCP17	-969	0.127	0.184 359						

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.23	0.175	0.199	4.80	0.0	19.94	12003.4	20	
V	Q	RN	CHIMINI	CHIMAX	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
67.5 (221.4)	11865. (247.8)	0.32E 07	-0.383	2.220	22.92	-0.00230	1.275	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		19.944	0.796 0	0.205 12	0.025 224	0.029 80	0.041 11	0.044 245	0.022 212
CN		1.280	0.605 60	0.091 39	0.106 21	0.115 318	0.088 242	0.033 167	0.026 27
CN		-0.106	0.126 194	0.044 138	0.032 128	0.035 76	0.027 11	0.017 259	0.012 259
DCP 1	-010	3.335	1.803 113	0.739 148	0.282 145	0.128 167	0.218 231	0.212 189	0.139 157
DCP 2	-020	3.100	1.755 107	0.619 134	0.248 112	0.116 38	0.232 246	0.117 226	0.054 187
DCP 3	-030	3.147	1.598 108	0.606 124	0.387 91	0.259 46	0.096 11	0.040 347	0.078 33
DCP 4	-049	3.096	1.509 123	0.516 105	0.378 106	0.255 38	0.039 335	0.016 341	0.046 45
DCP 5	-074	2.725	1.263 110	0.353 103	0.336 88	0.234 20	0.072 331	0.035 314	0.052 33
DCP 6	-099	2.515	1.092 98	0.306 103	0.301 73	0.233 13	0.098 325	0.040 321	0.069 16
DCP 7	-149	2.012	0.931 78	0.310 94	0.249 57	0.250 13	0.106 307	0.016 304	0.060 16
DCP 8	-200	1.841	0.833 73	0.252 80	0.250 55	0.242 10	0.126 310	0.038 308	0.052 7
DCP 9	-250	1.674	0.749 66	0.197 56	0.234 34	0.239 350	0.173 290	0.068 272	0.040 317
DCP10	-300	1.596	0.742 59	0.180 34	0.220 25	0.238 336	0.195 273	0.105 244	0.049 241
DCP11	-399	1.445	0.737 52	0.161 18	0.179 17	0.219 335	0.195 266	0.094 234	0.049 197
DCP12	-501	1.176	0.697 42	0.144 354	0.153 329	0.184 302	0.175 241	0.092 187	0.067 147
DCP13	-600	0.997	0.701 34	0.168 338	0.146 324	0.191 277	0.175 213	0.113 195	0.084 109
DCP14	-701	0.855	0.619 26	0.151 323	0.120 308	0.184 253	0.163 188	0.117 125	0.091 80
DCP15	-800	0.617	0.476 22	0.126 317	0.120 308	0.140 248	0.123 175	0.113 107	0.097 63
DCP16	-900	0.368	0.304 21	0.074 298	0.044 291	0.066 234	0.082 141	0.042 45	0.037 26
DCP17	-969	0.186	0.186 23	0.077 295	0.057 249	0.068 188	0.061 112	0.057 38	0.046 332

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION											
DRIVE HZ		K		MACH NO		DEL-ALPHA		DEL-H			
45.86		0.333		0.205		5.21		3.0			
TUNED HZ		RN		CHMINI		CHMAXI		ALPHA-MAX			
0.0		0.33E 07		-0.076		0.691		5.30			
HARMONIC ANALYSIS											
X/C		RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	TEST POINT 12035.1	CYCLES ANALYSED 20
ALPHA		0.075	5.208 0	0.284 3	0.066 326	0.020 199	3.336 104	3.025 65	3.015 212	0.008 267	0.011 161
CM		3.143	3.358 16	0.025 48	0.008 72	3.321 61	2.312 288	3.002 322	3.024 212	0.009 284	0.003 142
CM		-0.026	0.040 299	0.004 282	0.003 286	3.312 233	0.003 126	0.002 138	3.002 163	0.004 36	0.008 305
DCP 1	-0.10	-0.587	2.609 346	0.167 14	0.021 47	0.075 193	3.006 223	3.015 186	3.023 221	0.013 51	8.806 166
DCP 2	-0.20	-0.437	1.890 352	0.075 353	0.016 345	0.070 211	3.009 239	0.015 209	3.016 217	0.026 8	3.008 221
DCP 3	-0.30	-0.315	1.597 352	0.070 344	0.020 342	0.038 221	0.010 221	3.309 298	3.013 284	0.013 343	0.008 171
DCP 4	-0.40	-0.041	1.284 353	0.064 0	0.038 325	0.038 282	0.018 266	0.014 36	3.013 154	0.006 327	0.006 256
DCP 5	-0.74	0.159	1.030 355	0.064 2	0.013 20	0.033 213	3.007 272	0.006 203	3.003 154	0.012 7	3.004 177
DCP 6	-0.99	0.395	3.883 358	0.046 22	0.011 67	3.321 193	0.014 285	3.032 329	3.007 125	0.012 336	0.004 25
DCP 7	-1.49	0.213	0.561 4	0.051 30	0.014 29	0.030 193	0.009 298	0.016 126	3.003 34	0.013 316	3.007 152
DCP 8	-2.00	0.223	0.534 12	0.036 35	0.012 6	0.027 221	3.001 179	3.008 232	3.007 335	0.010 77	3.003 228
DCP 9	-2.50	0.175	0.489 13	0.027 33	0.021 63	0.022 31	3.002 270	3.005 115	3.016 26	0.012 354	0.005 151
DCP 10	-3.00	0.220	0.402 16	0.033 64	0.006 86	0.031 41	0.009 284	0.013 105	3.009 237	0.012 292	0.010 87
DCP 11	-3.59	0.259	0.341 33	0.031 92	0.007 90	0.042 52	3.015 260	3.005 340	3.008 300	0.027 295	0.008 127
DCP 12	-5.01	0.144	3.293 43	0.032 56	0.003 129	3.027 46	0.013 272	3.004 272	3.035 332	0.028 255	0.004 214
DCP 13	-6.00	0.187	0.249 51	0.028 46	0.017 61	3.031 69	0.011 254	0.008 291	3.008 251	0.019 246	0.004 45
DCP 14	-7.01	0.221	0.187 59	0.012 128	0.017 138	3.032 319	3.005 301	3.012 294	3.012 294	0.031 186	3.009 240
DCP 15	-8.00	0.118	0.136 71	0.016 98	-0.014 119	3.038 59	0.022 296	3.011 31	3.003 164	0.017 153	0.006 205
DCP 16	-9.00	-0.074	0.081 95	0.017 67	0.014 77	3.052 43	0.011 295	3.013 321	3.019 326	0.005 193	3.008 166
DCP 17	-9.69	0.023	0.036 136	0.003 120	0.004 16	3.043 58	0.017 15	0.011 206	3.010 236	0.023 267	0.014 58

FORCED PITCHING OSCILLATION									
DRIVE HZ		K		MACH NO		DEL-ALPHA		DEL-H	
46.00		0.344		0.200		5.20		0.0	
TUNED HZ		RN		CHMINI		CHMAXI		ALPHA-MAX	
0.0		0.32E 07		-0.066		0.698		7.70	
HARMONIC ANALYSIS									
		RES 2 PHI		RES 3 PHI		RES 4 PHI		RES 5 PHI	
		RES 1 PHI		RES 2 PHI		RES 3 PHI		RES 4 PHI	
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		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
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		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
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		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	
		RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI	

CYCLES ANALYSED

TEST POINT
12005.2ALPHA-0
2.48AERO DAMP
-0.00142

CYCLES ANALYSED

TEST POINT
12005.2ALPHA-0
2.48AERO DAMP
-0.00142

DATA TYPE	K/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		DRIVE MZ		K		DEL-ALPHA		DEL-H		ALPHA-0		TEST POINT	
		TUNED MZ 0.0	Q	RN	CHIMIN	CHIMAX	0.5-20	0.0	1.7-26	AERO DAMP	TDR	EXT DAMP	20
HARMONIC ANALYSIS													
	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI			
ALPHA	5.006	5.199	0	0.293	3	0.090	308	0.019	190	0.036	96	0.027	63
CN	0.587	0.344	16	0.022	41	0.008	35	0.018	119	0.005	281	0.005	20
CM	-0.012	0.042	292	0.003	297	0.001	311	0.017	337	0.001	106	0.002	182
DCP 1	2.542	2.519	347	0.116	395	0.022	115	0.071	40	0.016	183	0.013	2
DCP 2	1.866	1.942	352	0.108	5	0.019	1	0.072	47	0.013	183	0.024	63
DCP 3	1.998	1.655	352	0.091	9	0.018	1	0.046	47	0.012	186	0.019	30
DCP 4	1.593	1.360	354	0.069	12	0.028	3	0.035	27	0.008	186	0.004	305
DCP 5	1.300	1.079	356	0.063	9	0.016	6	0.039	31	0.004	241	0.005	67
DCP 6	1.518	0.910	359	0.056	16	0.027	13	0.030	32	0.011	178	0.015	356
DCP 7	1.052	0.676	3	0.040	22	0.014	31	0.027	44	0.008	284	0.006	103
DCP 8	0.914	0.577	11	0.035	66	0.020	12	0.041	38	0.009	52	0.009	117
DCP 9	0.746	0.494	13	0.026	32	0.015	53	0.029	129	0.017	260	0.009	149
DCP 10	0.731	0.425	19	0.030	33	0.023	51	0.015	121	0.011	344	0.005	136
DCP 11	0.556	0.351	34	0.033	62	0.010	51	0.028	136	0.010	339	0.002	103
DCP 12	0.418	0.295	42	0.029	84	0.007	87	0.021	168	0.004	264	0.007	345
DCP 13	0.375	0.247	52	0.014	69	0.003	24	0.030	148	0.013	273	0.019	356
DCP 14	0.353	0.189	61	0.014	56	0.014	153	0.017	160	0.016	264	0.007	318
DCP 15	0.173	0.142	78	0.013	102	0.002	140	0.025	142	0.003	255	0.003	159
DCP 16	-0.051	0.084	101	0.003	118	0.013	137	0.039	134	0.003	117	0.006	13
DCP 17	-0.015	0.031	155	0.010	263	0.012	14	0.024	181	0.006	110	0.017	27

HARMONIC ANALYSIS

DATA TYPE	K/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED				
		DRIVE MZ		K		DEL-ALPHA		DEL-H		ALPHA-0		TEST POINT		
		TUNED MZ 0.0	Q	RN	CMINING	CMINING	5.20	0.196	0.0	7.51	12005.4	EXT DAMP 0.0		
V		66.5 (218.3)	11558. (241.4)	0.32E 07	-0.069	1.218	12.78							
HARMONIC ANALYSIS														
	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI				
ALPHA		5.200	0	0.305	3	0.088	305	0.014	108	0.040	98	0.026	52	
CN		0.823	0.363	18	0.030	44	0.008	44	0.040	113	0.005	293	0.009	313
CM		-0.008	0.043	291	0.006	281	0.003	293	0.012	305	0.001	174	0.003	140
DCP 1	-010	3.974	2.255	346	0.258	39	0.202	330	0.042	223	0.038	252	0.070	191
DCP 2	-020	3.127	1.931	353	0.111	358	0.035	359	0.034	80	0.018	273	0.013	215
DCP 3	-030	3.026	1.674	353	0.094	354	0.024	12	0.029	93	0.002	271	0.008	152
DCP 4	-040	2.980	1.362	355	0.077	5	0.023	11	0.034	62	0.010	226	0.003	339
DCP 5	-050	2.219	1.092	356	0.069	7	0.018	342	0.037	86	0.013	281	0.011	306
DCP 6	-060	2.094	0.912	0	0.063	21	0.016	332	0.045	74	0.003	178	0.010	307
DCP 7	-070	1.492	0.700	2	0.051	23	0.012	22	0.031	57	0.005	10	0.006	225
DCP 8	-080	1.252	0.568	13	0.035	37	0.015	49	0.034	92	0.015	290	0.007	192
DCP 9	-090	1.043	0.486	15	0.041	32	0.008	156	0.039	102	0.009	249	0.017	304
DCP 10	-100	0.991	0.418	18	0.035	46	0.020	6	0.040	95	0.011	320	0.009	49
DCP 11	-110	0.861	0.354	37	0.039	63	0.003	88	0.056	132	0.011	321	0.004	268
DCP 12	-120	0.540	0.244	44	0.034	74	0.011	62	0.043	121	0.011	0	0.019	317
DCP 13	-130	0.481	0.245	55	0.022	82	0.008	26	0.052	114	0.012	255	0.029	324
DCP 14	-140	0.437	0.202	67	0.021	97	0.012	109	0.039	135	0.006	333	0.007	322
DCP 15	-150	0.217	0.149	92	0.017	99	0.016	69	0.037	124	0.009	322	0.016	258
DCP 16	-160	-0.024	0.084	88	0.012	61	0.013	160	0.070	117	0.012	127	0.016	309
DCP 17	-169	-0.021	0.008	115	0.005	18	0.011	128	0.036	125	0.005	50	0.014	50

HARMONIC ANALYSIS

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ		DRIVE MZ		K		MACH NO		AIRFOIL	
0.0		0.347		0.347		0.199		DEL-ALPHA 5.14	
V		11956. (249.7)		0.32E 07		-0.306		DEL-ALPHA 5.14	
(221.6)								DEL-ALPHA 5.14	
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								DEL-ALPHA 5	

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED M2		DRIVE M2	K	MACH N2	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED
0.0		67.57	0.308	0.199	5.90	0.0	12.52	12007.6	20
MARINIC ANALYSIS									
V		Q	RN	CMIMIN	CMIMAX	ALPHA-MIN	ALPHA-MAX	TOR	EXT DAMP
67.7 (222.2)		11937. (249.3)	0.32E 07	-0.070	1.47	10.59	-0.00130	0.782	0.0
MARINIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PH1	RES 2 PH1	RES 3 PH1	RES 4 PH1	RES 5 PH1	RES 6 PH1	RES 7 PH1
ALPHA		12.520	5.902	0	0.496	343	0.151	184	0.057
CM		1.155	0.380	35	0.056	64	0.013	297	0.010
CM		-0.002	0.060	294	0.016	279	0.004	129	0.005
DCP 1	-0.010	5.831	1.597	359	0.485	440	0.213	176	0.145
DCP 2	-0.020	4.914	1.737	1	0.291	2	0.049	222	0.035
DCP 3	-0.030	4.614	1.590	358	0.159	2	0.008	254	0.004
DCP 4	-0.049	3.686	1.329	8	0.188	330	0.057	160	0.013
DCP 5	-0.074	3.162	1.049	10	0.119	312	0.036	139	0.016
DCP 6	-0.094	2.842	0.922	12	0.085	336	0.024	99	0.025
DCP 7	-0.149	2.148	0.733	14	0.025	12	0.021	13	0.021
DCP 8	-0.200	1.852	0.636	15	0.005	123	0.059	8	0.015
DCP 9	-0.300	1.350	0.511	25	0.114	73	0.054	298	0.012
DCP 10	-0.350	1.117	0.441	31	0.105	73	0.047	279	0.019
DCP 11	-0.399	0.399	0.399	53	0.096	84	0.027	276	0.011
DCP 12	-0.501	0.337	0.337	76	0.035	83	0.017	289	0.011
DCP 13	-0.701	0.638	0.488	85	0.005	79	0.016	330	0.034
DCP 14	-0.800	0.462	0.221	97	0.052	98	0.020	358	0.015
DCP 15	-0.900	0.316	0.118	112	0.049	95	0.028	291	0.017
DCP 16	-0.969	0.000	0.004	91	0.020	34	0.017	105	0.011
FORCED PITCHING OSCILLATION									
TUNED M2		DRIVE M2	K	MACH N2	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED
0.0		67.31	0.504	0.200	2.90	0.0	15.07	12007.7	20
MARINIC ANALYSIS									
V		Q	RN	CMIMIN	CMIMAX	ALPHA-MIN	ALPHA-MAX	TOR	EXT DAMP
67.9 (222.9)		12018. (251.0)	0.32E 07	-0.085	1.581	19.50	-0.00063	0.137	0.0
DATA TYPE	X/C	RES 0	RES 1 PH1	RES 2 PH1	RES 3 PH1	RES 4 PH1	RES 5 PH1	RES 6 PH1	RES 7 PH1
ALPHA		15.072	5.807	0	0.397	337	0.116	194	0.085
CM		1.219	0.397	11	0.112	86	0.018	326	0.012
CM		-0.017	0.035	353	0.041	252	0.013	39	0.003
DCP 1	-0.010	4.937	1.902	52	0.739	343	0.244	293	0.321
DCP 2	-0.020	4.440	1.888	38	0.492	352	0.249	296	0.159
DCP 3	-0.030	4.241	1.880	26	0.255	301	0.093	152	0.019
DCP 4	-0.049	3.719	1.552	42	0.424	308	0.117	131	0.019
DCP 5	-0.074	3.165	1.402	13	0.348	274	0.244	110	0.143
DCP 6	-0.099	2.916	1.248	13	0.274	238	0.218	64	0.115
DCP 7	-0.149	2.335	1.146	1	0.258	181	0.155	68	0.133
DCP 8	-0.200	2.043	0.917	356	0.237	160	0.135	40	0.103
DCP 9	-0.250	1.763	0.779	342	0.296	141	0.109	342	0.074
DCP 10	-0.300	1.536	0.577	339	0.237	97	0.137	316	0.051
DCP 11	-0.399	1.446	0.347	347	0.337	77	0.111	269	0.051
DCP 12	-0.501	0.671	0.164	45	0.194	66	0.086	241	0.044
DCP 13	-0.600	0.431	0.097	96	0.167	54	0.085	206	0.046
DCP 14	-0.800	0.295	0.132	124	0.120	54	0.076	170	0.046
DCP 15	-0.900	0.195	0.122	117	0.070	16	0.047	157	0.027
DCP 16	-0.969	0.046	0.051	125	0.033	61	0.024	143	0.027

FORCED PITCHING OSCILLATION													
TUNED MZ		DRIVE MZ		K		MACH NO		AIRFOIL		NLR 1		CYCLES ANALYSED	
0.0		68.74		0.516		0.200		DEL-ALPHA 5.96		DEL-H 0.0		TEST POINT 12007.8	
V		C		RN		CH(MIN)		CH(MAX)		ALPHA-NMAX		EXT DAMP	
(222.6)		12023.1		0.32E 07		-0.260		1.795		23.99		AERO DAMP 0.00106	
		(251.1)										TDR -0.637	
HARMONIC ANALYSIS													
X/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12
ALPHA	17.561	5.962	0	0.466	0.130	0.203	0.053	115	0.051	1	0.024	98	0.025
CN	1.325	0.562	359	0.133	0.036	266	0.034	54	0.016	253	0.017	25	0.011
CM	-0.077	0.079	49	0.075	0.022	83	0.006	2.0	0.007	27	0.008	223	0.002
DCP 1	4.289	2.481	55	0.357	0.285	331	0.286	317	0.231	257	0.147	211	0.100
DCP 2	3.984	2.633	45	0.505	0.218	237	0.126	86	0.106	6	0.118	274	0.106
DCP 3	3.617	2.447	39	0.571	0.423	254	0.215	154	0.185	104	0.184	10	0.118
DCP 4	3.480	2.173	33	0.586	0.215	210	0.191	132	0.123	58	0.079	340	0.080
DCP 5	3.045	1.912	25	0.410	0.232	198	0.204	102	0.119	74	0.091	324	0.052
DCP 6	2.798	1.725	20	0.358	0.249	173	0.187	79	0.142	359	0.074	283	0.092
DCP 7	2.311	1.621	5	0.384	0.241	143	0.179	67	0.143	330	0.085	249	0.094
DCP 8	2.035	1.447	3	0.396	0.210	132	0.197	49	0.143	312	0.099	213	0.093
DCP 9	1.789	1.236	347	0.443	0.177	0.265	0.283	347	0.208	229	0.119	139	0.084
DCP10	1.601	1.043	341	0.437	0.258	42	0.226	296	0.160	185	0.113	76	0.064
DCP11	1.393	0.760	336	0.537	0.140	0.295	0.188	252	0.112	146	0.101	36	0.050
DCP12	1.109	0.543	316	0.585	0.108	0.299	0.159	166	0.063	324	0.083	121	0.036
DCP13	0.902	0.305	283	0.529	81	0.281	0.160	113	0.078	326	0.053	191	0.021
DCP14	0.752	0.218	232	0.444	48	0.209	0.135	75	0.088	260	0.035	80	0.030
DCP15	0.555	0.207	186	0.316	22	0.132	0.087	14	0.047	189	0.014	209	0.012
DCP16	0.248	0.107	157	0.180	357	0.076	0.039	354	0.042	211	0.015	261	0.024
DCP17	0.163	0.126	187	0.161	344	0.076	0.049	228	0.035	335	0.049	70	0.031

FORCED PITCHING OSCILLATION																				
TUNED MZ		DRIVE MZ		K		MACH NO		DEL-ALPHA		DEL-H		ALPHA-0		TEST POINT		CYCLES ANALYSED				
0.0		68.82		0.520		0.198		5.93		0.0		19.97		12007.9		20				
V		Q		RN		CN(MIN)		CN(MAX)		ALPHA-NMAX		AERO DAMP		TDR		EXT DAMP				
(220.9)		11846.1		0.32E 07		-0.314		2.081		25.94		0.00215		-1.284		0.0				
		(247.4)																		
HARMONIC ANALYSIS																				
DATA	X/C	RES 0	RES 1	PM1	RES 2	PM2	RES 3	PM3	RES 4	PM4	RES 5	PM5	RES 6	PM6	RES 7	PM7	RES 8	PM8	RES 9	PM9
TYPE																				
ALPHA		19.973	5.931	0	0.532	332	0.100	210	0.060	138	0.045	19	0.015	46	0.018	193	0.019	132	0.003	41
CN		1.442	0.654	7	0.058	157	0.031	331	0.034	176	0.008	16	0.019	86	0.004	107	0.013	559	0.011	265
CM		-0.136	0.113	70	0.058	267	0.019	176	0.013	30	0.009	164	0.007	318	0.004	43	0.004	241	0.003	49
DCP 1	-010	3.621	2.723	67	0.629	52	0.237	319	0.138	358	0.237	28	0.170	356	0.137	283	0.154	247	0.125	178
DCP 2	-020	3.413	2.636	62	0.643	44	0.310	315	0.242	258	0.148	161	0.128	69	0.068	42	0.059	331	0.057	305
DCP 3	-030	3.346	2.527	57	0.634	26	0.423	304	0.213	262	0.266	199	0.183	147	0.127	94	0.127	67	0.136	34
DCP 4	-040	3.264	2.292	49	0.581	347	0.378	278	0.247	210	0.126	171	0.170	114	0.121	75	0.118	17	0.118	335
DCP 5	-050	2.902	2.029	39	0.510	326	0.413	253	0.279	175	0.133	125	0.160	69	0.080	17	0.108	327	0.088	274
DCP 6	-060	2.724	1.852	32	0.457	308	0.367	235	0.270	157	0.152	99	0.130	42	0.064	332	0.069	293	0.068	226
DCP 7	-070	2.307	1.759	20	0.517	286	0.321	214	0.291	136	0.120	62	0.147	4	0.091	297	0.102	119	0.089	147
DCP 8	-080	2.063	1.694	19	0.600	271	0.355	199	0.303	109	0.173	38	0.146	333	0.067	260	0.055	208	0.043	147
DCP 9	-090	1.900	1.552	7	0.651	234	0.405	144	0.354	51	0.210	316	0.146	267	0.089	118	0.067	74	0.077	20
DCP10	-100	1.767	1.363	359	0.594	213	0.385	104	0.299	3	0.168	263	0.114	185	0.077	118	0.057	4	0.075	302
DCP11	-110	1.596	1.052	350	0.610	186	0.422	64	0.261	316	0.126	217	0.079	127	0.047	107	0.055	312	0.038	233
DCP12	-120	1.313	0.766	329	0.522	109	0.415	13	0.252	243	0.107	124	0.050	26	0.028	17	0.020	175	0.021	122
DCP13	-130	1.143	0.539	301	0.522	109	0.371	334	0.225	194	0.065	98	0.028	34	0.021	19	0.015	25	0.031	31
DCP14	-140	0.967	0.353	259	0.426	74	0.273	290	0.131	126	0.043	347	0.018	184	0.010	139	0.006	263	0.033	270
DCP15	-150	0.745	0.268	216	0.302	47	0.196	253	0.093	80	0.035	332	0.302	35	0.034	129	0.016	225	0.017	286
DCP16	-160	0.417	0.234	199	0.235	4	0.077	160	0.061	170	0.094	331	0.080	91	0.094	23	0.043	28	0.036	172
DCP17	-169	0.336	0.393	211	0.344	351	0.229	122	0.188	248	0.144	24	0.112	159	0.089	286	0.072	82	0.018	208

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 45.79	K 0.227	MACH NO 0.303	DEL-ALPHA 5.52	DEL-H 0.0	ALPHA-0 2.43	TEST POINT 12011.2	RES 7 PMI	RES 8 PMI	RES 9 PMI	EXT DAMP 0.0
ALPHA CN		102.6 (336.5)	27435. (573.0)	0.49E 07	CH(MIN)	CN(MAX)	ALPHA-MAX	ASD DAMP	TDR	0.768	0.001 90	0.001 311	0.001 25
DCP 1	-010	0.961	2.767 344	0.141 0	0.036 335	0.012 89	0.008 238	0.005 124	0.005 274	0.005 274	0.003 176	0.009 29	
DCP 2	-020	0.841	2.110 349	0.106 4	0.060 332	0.007 73	0.012 168	0.007 97	0.005 214	0.005 214	0.002 242	0.009 0	
DCP 3	-030	0.966	1.775 349	0.082 356	0.049 330	0.007 93	0.001 114	0.006 205	0.008 131	0.008 131	0.002 84	0.008 281	
DCP 4	-040	0.918	1.463 350	0.059 352	0.023 350	0.010 68	0.007 206	0.003 2	0.012 253	0.012 253	0.006 209	0.005 16	
DCP 5	-074	0.918	1.153 351	0.049 357	0.022 339	0.006 82	0.010 216	0.004 309	0.009 225	0.009 225	0.004 158	0.004 30	
DCP 6	-099	0.915	0.984 353	0.048 10	0.019 339	0.011 58	0.004 223	0.004 275	0.004 175	0.004 175	0.007 203	0.003 187	
DCP 7	-149	0.931	0.735 355	0.030 5	0.012 11	0.003 196	0.005 48	0.008 84	0.007 90	0.007 90	0.005 138	0.004 25	
DCP 8	-200	0.943	0.505 1	0.024 14	0.012 351	0.002 91	0.001 248	0.008 203	0.010 326	0.010 326	0.007 289	0.001 326	
DCP 9	-250	0.959	0.521 1	0.032 14	0.007 21	0.018 181	0.004 161	0.003 193	0.004 264	0.004 264	0.001 164	0.005 226	
DCP10	-300	0.943	0.437 2	0.028 31	0.012 356	0.020 172	0.001 212	0.003 123	0.005 286	0.005 286	0.002 163	0.004 108	
DCP11	-399	0.987	0.349 14	0.028 55	0.008 39	0.021 190	0.003 183	0.004 120	0.004 470	0.004 470	0.006 85	0.005 164	
DCP12	-501	0.262	0.270 22	0.021 53	0.009 16	0.013 186	0.005 295	0.005 142	0.001 278	0.001 278	0.003 155	0.004 299	
DCP13	-600	0.254	0.206 29	0.015 21	0.006 40	0.011 173	0.009 337	0.005 168	0.011 282	0.011 282	0.004 205	0.004 272	
DCP14	-701	0.267	0.154 37	0.017 72	0.011 116	0.019 179	0.005 353	0.004 304	0.003 254	0.003 254	0.007 110	0.004 126	
DCP15	-800	0.140	0.100 49	0.010 62	0.003 68	0.015 165	0.008 10	0.008 69	0.004 281	0.004 281	0.003 345	0.004 154	
DCP16	-900	-0.070	0.043 62	0.014 98	0.009 151	0.020 198	0.005 78	0.002 199	0.001 296	0.001 296	0.008 200	0.008 264	
DCP17	-969	-0.045	0.022 150	0.008 326	0.004 235	0.023 197	0.011 359	0.006 58	0.009 134	0.009 134	0.006 75	0.002 271	

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 45.75	K 0.230	MACH NO 0.300	DEL-ALPHA 5.54	DEL-H 0.0	ALPHA-0 5.01	TEST POINT 12011.3	RES 7 PMI	RES 8 PMI	RES 9 PMI	EXT DAMP 0.0
ALPHA CN		101.5 (332.9)	26947. (562.8)	0.48E 07	CH(MIN)	CN(MAX)	ALPHA-MAX	ASD DAMP	TDR	0.789	0.001 265	0.001 160	0.001 16
DCP 1	-010	2.546	2.003 344	0.137 11	0.075 316	0.049 204	0.007 66	0.007 115	0.007 30	0.007 30	0.007 265	0.004 229	
DCP 2	-020	2.110	2.110 350	0.095 3	0.022 125	0.022 201	0.008 13	0.010 172	0.004 6	0.004 6	0.010 208	0.003 264	
DCP 3	-030	2.022	1.777 349	0.079 3	0.019 322	0.009 158	0.008 319	0.005 163	0.003 212	0.003 212	0.007 188	0.002 249	
DCP 4	-049	1.799	1.471 350	0.060 359	0.023 329	0.014 193	0.006 310	0.009 190	0.003 258	0.003 258	0.009 180	0.006 226	
DCP 5	-074	1.629	1.161 351	0.054 4	0.022 332	0.014 205	0.006 328	0.005 172	0.001 238	0.001 238	0.005 182	0.005 214	
DCP 6	-099	1.514	0.976 353	0.050 8	0.016 334	0.015 199	0.010 351	0.003 131	0.003 286	0.003 286	0.008 129	0.003 230	
DCP 7	-149	1.110	0.719 356	0.035 14	0.020 336	0.011 195	0.008 247	0.007 181	0.001 270	0.001 270	0.007 88	0.007 289	
DCP 8	-200	0.912	0.599 2	0.034 27	0.007 346	0.017 181	0.006 368	0.002 213	0.006 246	0.006 246	0.004 306	0.005 228	
DCP 9	-250	0.768	0.516 2	0.031 17	0.016 21	0.019 31	0.004 120	0.001 332	0.003 185	0.003 185	0.002 27	0.004 312	
DCP10	-300	0.711	0.432 5	0.028 33	0.013 359	0.016 41	0.007 185	0.015 77	0.002 50	0.002 50	0.002 274	0.005 154	
DCP11	-399	0.601	0.349 17	0.027 51	0.009 10	0.021 62	0.008 207	0.009 56	0.005 108	0.005 108	0.004 144	0.003 278	
DCP12	-501	0.428	0.274 23	0.016 55	0.011 37	0.016 75	0.007 260	0.007 22	0.006 91	0.006 91	0.003 271	0.003 264	
DCP13	-600	0.377	0.215 29	0.024 52	0.004 345	0.015 75	0.002 87	0.006 52	0.002 90	0.002 90	0.005 47	0.004 205	
DCP14	-701	0.353	0.144 41	0.020 71	0.007 43	0.020 65	0.004 390	0.015 296	0.004 73	0.004 73	0.002 48	0.009 144	
DCP15	-800	0.192	0.101 53	0.017 59	0.007 43	0.020 65	0.004 390	0.015 296	0.004 67	0.004 67	0.003 60	0.007 150	
DCP16	-900	-0.040	0.044 70	0.009 55	0.004 50	0.013 33	0.009 42	0.003 34	0.008 75	0.008 75	0.001 2	0.010 276	
DCP17	-969	-0.031	0.026 154	0.005 283	0.001 37	0.028 113	0.017 270	0.003 90	0.004 141	0.004 141	0.001 284	0.008 183	

HARMONIC ANALYSIS

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
V	Q	RN	C(MIN)	CN(MAX)	ALPHA-MAX	AERO DAMP	TOR	RES 8 PHI	RES 9 PHI
0.0	45.77	0.234	0.296	5.37	0.0	17.45	12011.0	0.0	0.0
99.8	26286.	0.48E 07	-0.313	2.155	20.06	0.00013	-0.111	0.0	0.0
(327.3)	(549.0)								
HARMONIC ANALYSIS									
DATA TYPE	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	17.454	5.372 0	0.326 21	0.145 357	0.140 149	0.022 191	0.019 15	0.017 177	0.016 314
CN	1.240	0.656 49	0.127 16	0.095 310	0.021 212	0.026 306	0.024 238	0.008 267	0.008 213
CM	-0.000	0.141 182	0.051 98	0.030 47	0.022 321	0.003 326	0.008 336	0.007 221	0.003 232
DCP 1	0.010	3.791	2.378 137	0.764 103	0.424 130	0.291 177	0.198 164	0.131 152	0.071 174
DCP 2	0.020	3.430	2.033 129	0.687 95	0.327 99	0.204 168	0.153 179	0.204 172	0.142 163
DCP 3	0.030	2.964	1.772 127	0.558 129	0.440 100	0.207 160	0.154 179	0.094 143	0.115 138
DCP 4	0.040	3.335	1.037 182	0.543 94	0.252 78	0.225 62	0.185 118	0.076 12	0.069 4
DCP 5	0.074	2.903	1.078 86	0.326 71	0.194 62	0.184 44	0.101 333	0.058 328	0.056 340
DCP 6	0.099	2.631	1.188 78	0.306 51	0.213 37	0.140 35	0.127 322	0.079 296	0.045 313
DCP 7	0.149	2.105	1.004 70	0.437 55	0.401 359	0.087 348	0.117 337	0.102 296	0.067 274
DCP 8	0.200	1.800	1.003 68	0.457 52	0.376 352	0.158 311	0.063 347	0.096 312	0.066 294
DCP 9	0.250	1.646	1.034 58	0.450 37	0.375 338	0.144 306	0.120 297	0.096 280	0.076 255
DCP10	0.300	1.460	0.915 53	0.382 34	0.375 335	0.191 295	0.121 292	0.106 241	0.073 221
DCP11	0.395	1.336	0.915 44	0.285 19	0.318 326	0.184 281	0.133 276	0.119 208	0.094 196
DCP12	0.501	1.122	0.890 31	0.249 336	0.284 286	0.171 229	0.136 276	0.125 135	0.087 122
DCP13	0.600	0.954	0.831 21	0.266 303	0.260 248	0.179 181	0.095 171	0.113 147	0.077 61
DCP14	0.701	0.778	0.669 11	0.249 270	0.241 209	0.178 137	0.075 96	0.083 21	0.043 3
DCP15	0.800	0.528	0.510 2	0.231 255	0.197 181	0.168 108	0.079 48	0.058 321	0.007 324
DCP16	0.900	0.196	0.263 355	0.103 245	0.078 173	0.094 89	0.034 28	0.026 21	0.015 298
DCP17	0.949	0.050	0.116 356	0.061 226	0.050 142	0.060 71	0.020 297	0.033 37	0.033 333

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
V	Q	RN	C(MIN)	CN(MAX)	ALPHA-MAX	AERO DAMP	TOR	RES 8 PHI	RES 9 PHI
0.0	45.75	0.234	0.295	5.35	0.0	19.94	12011.9	0.0	0.0
99.4	26090.	0.48E 07	-0.346	2.182	22.32	-0.00069	0.572	0.0	0.0
(326.2)	(544.9)								
HARMONIC ANALYSIS									
DATA TYPE	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	19.934	5.352 0	0.241 14	0.086 79	0.144 190	0.013 340	0.009 86	0.014 180	0.022 124
CN	1.250	0.658 54	0.122 50	0.140 335	0.022 274	0.017 22	0.018 350	0.009 297	0.009 340
CM	-0.100	0.149 188	0.047 136	0.045 105	0.019 17	0.005 356	0.005 25	0.005 3	0.001 276
DCP 1	0.010	2.280 138	0.803 160	0.271 149	0.355 221	0.206 261	0.102 247	0.118 244	0.059 264
DCP 2	0.020	2.162	0.619 150	0.267 106	0.170 233	0.257 249	0.107 270	0.146 278	0.091 260
DCP 3	0.030	2.875	1.561 134	0.634 171	0.222 210	0.149 236	0.121 231	0.109 265	0.090 295
DCP 4	0.040	2.995	1.310 116	0.441 131	0.324 108	0.190 120	0.063 94	0.079 130	0.049 132
DCP 5	0.074	2.648	1.182 99	0.338 123	0.282 76	0.078 116	0.154 95	0.057 82	0.042 118
DCP 6	0.099	2.403	1.261 86	0.331 111	0.285 59	0.106 89	0.169 80	0.068 43	0.049 106
DCP 7	0.149	2.041	1.052 73	0.423 88	0.324 38	0.135 31	0.122 34	0.048 47	0.026 52
DCP 8	0.200	1.776	0.937 73	0.435 84	0.338 44	0.119 16	0.097 31	0.053 68	0.040 74
DCP 9	0.250	1.652	0.941 64	0.456 70	0.388 28	0.167 1	0.095 25	0.087 9	0.043 42
DCP10	0.300	1.520	0.876 56	0.462 62	0.389 21	0.194 353	0.105 324	0.064 336	0.045 325
DCP11	0.399	1.409	0.919 47	0.318 45	0.370 13	0.182 343	0.169 334	0.098 309	0.079 283
DCP12	0.501	1.189	0.910 35	0.271 8	0.151 204	0.131 286	0.122 275	0.100 250	0.065 238
DCP13	0.600	1.001	0.856 27	0.271 337	0.159 241	0.090 132	0.089 227	0.061 206	0.058 167
DCP14	0.701	0.827	0.716 17	0.240 305	0.180 195	0.090 156	0.053 146	0.047 137	0.039 96
DCP15	0.800	0.598	0.518 11	0.176 287	0.193 251	0.104 128	0.033 95	0.027 59	0.024 17
DCP16	0.900	0.241	0.289 5	0.088 253	0.076 143	0.045 109	0.034 131	0.034 89	0.022 345
DCP17	0.949	0.085	0.143 10	0.062 231	0.070 116	0.035 24	0.025 233	0.045 168	0.036 87

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 23.11	K 0.089	MACH NO 0.393	DEL-ALPHA 5.10	DEL-M 0.0	ALPHA-0 12.47	TEST POINT 12017.6	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA		12.475	5.096	0	0.042	0.016	0.089	0.001	0.012	0.030	0.007	0.007	0.007
CN		0.923	0.270	84	0.091	0.016	0.089	0.001	0.012	0.030	0.007	0.007	0.007
CM		-0.039	0.066	198	0.016	0.009	0.011	0.009	0.007	0.009	0.002	0.002	0.002
DCP 1	-010	4.073	0.932	149	0.302	0.141	0.197	0.107	0.103	0.045	0.045	0.045	0.045
DCP 2	-020	3.541	1.036	131	0.247	0.124	0.175	0.155	0.126	0.093	0.093	0.093	0.093
DCP 3	-030	3.123	0.956	124	0.393	0.188	0.136	0.137	0.123	0.091	0.091	0.091	0.091
DCP 4	-040	2.417	1.009	150	0.319	0.110	0.130	0.064	0.074	0.047	0.047	0.047	0.047
DCP 5	-074	2.128	0.947	143	0.267	0.082	0.112	0.051	0.058	0.026	0.026	0.026	0.026
DCP 6	-099	1.913	0.717	134	0.231	0.073	0.115	0.053	0.062	0.033	0.033	0.033	0.033
DCP 7	-149	1.551	0.544	115	0.214	0.079	0.117	0.061	0.065	0.042	0.042	0.042	0.042
DCP 8	-200	1.342	0.453	101	0.213	0.086	0.101	0.064	0.052	0.036	0.036	0.036	0.036
DCP 9	-250	1.248	0.432	87	0.213	0.080	0.101	0.063	0.057	0.032	0.032	0.032	0.032
DCP10	-300	1.112	0.398	77	0.188	0.078	0.104	0.063	0.051	0.032	0.032	0.032	0.032
DCP11	-399	0.960	0.350	64	0.138	0.045	0.127	0.056	0.033	0.037	0.037	0.037	0.037
DCP12	-501	0.740	0.277	55	0.067	0.017	0.268	0.040	0.033	0.044	0.044	0.044	0.044
DCP13	-600	0.645	0.277	45	0.049	0.024	0.291	0.035	0.033	0.046	0.046	0.046	0.046
DCP14	-701	0.538	0.234	39	0.057	0.035	0.293	0.046	0.034	0.036	0.036	0.036	0.036
DCP15	-800	0.348	0.219	29	0.052	0.038	0.272	0.042	0.034	0.033	0.033	0.033	0.033
DCP16	-900	0.101	0.197	13	0.038	0.010	0.345	0.015	0.014	0.017	0.017	0.017	0.017
DCP17	-969	0.003	0.096	7	0.019	0.003	0.355	0.010	0.014	0.017	0.017	0.017	0.017

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 23.14	K 0.089	MACH NO 0.394	DEL-ALPHA 5.09	DEL-M 0.0	ALPHA-0 15.02	TEST POINT 12017.7	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA		15.022	5.094	0	0.040	0.013	0.249	0.071	0.051	0.002	0.002	0.002	0.002
CN		0.953	0.278	94	0.032	0.044	0.128	0.023	0.015	0.005	0.005	0.005	0.005
CM		-0.052	0.071	201	0.012	0.016	0.249	0.007	0.006	0.002	0.002	0.002	0.002
DCP 1	-010	3.979	1.263	160	0.656	0.152	0.251	0.093	0.023	0.069	0.069	0.069	0.069
DCP 2	-020	3.576	1.267	152	0.781	0.169	0.275	0.068	0.049	0.046	0.046	0.046	0.046
DCP 3	-030	3.066	0.919	149	0.365	0.224	0.216	0.073	0.077	0.053	0.053	0.053	0.053
DCP 4	-040	2.505	1.083	156	0.389	0.225	0.237	0.055	0.066	0.072	0.072	0.072	0.072
DCP 5	-074	2.059	0.883	149	0.335	0.188	0.220	0.059	0.050	0.070	0.070	0.070	0.070
DCP 6	-099	1.890	0.728	141	0.282	0.170	0.208	0.055	0.057	0.067	0.067	0.067	0.067
DCP 7	-149	1.560	0.578	124	0.203	0.149	0.182	0.062	0.043	0.046	0.046	0.046	0.046
DCP 8	-200	1.365	0.506	115	0.174	0.134	0.165	0.063	0.058	0.044	0.044	0.044	0.044
DCP 9	-250	1.282	0.459	102	0.153	0.126	0.139	0.069	0.055	0.041	0.041	0.041	0.041
DCP10	-300	1.145	0.406	93	0.137	0.112	0.119	0.060	0.052	0.034	0.034	0.034	0.034
DCP11	-399	1.009	0.358	78	0.100	0.086	0.107	0.044	0.043	0.029	0.029	0.029	0.029
DCP12	-501	0.807	0.320	63	0.073	0.067	0.098	0.037	0.034	0.018	0.018	0.018	0.018
DCP13	-600	0.681	0.289	50	0.067	0.053	0.141	0.033	0.034	0.011	0.011	0.011	0.011
DCP14	-701	0.573	0.250	39	0.056	0.054	0.145	0.033	0.032	0.012	0.012	0.012	0.012
DCP15	-800	0.402	0.252	29	0.077	0.058	0.123	0.028	0.026	0.009	0.009	0.009	0.009
DCP16	-900	0.156	0.194	18	0.071	0.031	0.272	0.017	0.016	0.012	0.012	0.012	0.012
DCP17	-969	0.028	0.086	20	0.037	0.003	0.359	0.013	0.008	0.008	0.008	0.008	0.008

HARMONIC ANALYSIS

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION										AIRFOIL NLR 1										CYCLES ANALYSED												
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-O	ALPHA-MAX	ALPHA-MIN	ALPHA-MAX	ALPHA-MIN	DEL-ALPHA	DEL-M	ALPHA-O	ALPHA-MAX	ALPHA-MIN	DEL-ALPHA	DEL-M	ALPHA-O	ALPHA-MAX	ALPHA-MIN	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP		
0.0	23.12	0.008	0.394	5.12	0.0	17.51	0.0	0.0	0.0	0.0	5.12	0.0	17.51	0.0	0.0	5.12	0.0	17.51	0.0	12017.8	0.0	12017.8	0.0	12017.8	0.0	12017.8	0.0	12017.8	0.0			
V	Q	RN	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	CHIMIN	CHIMAX	CHIMIN	CHIMAX	CHIMIN	TDR	EXT DAMP	TDR	EXT DAMP	TDR	EXT DAMP	TDR	EXT DAMP	TDR	EXT DAMP		
(436.4)	17371. (362.8)	0.24E 07	-0.136	1.278	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	3.104	0.0	3.104	0.0	3.104	0.0	3.104	0.0	3.104	0.0		
HARMONIC ANALYSIS																																
DATA TYPE	Z/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16	RES 17	RES 18	RES 19	RES 20	RES 21	RES 22	RES 23	RES 24	RES 25	RES 26	RES 27	RES 28		
ALPHA		17.507	5.116	0	0.044	0.262	0.010	0.359	0.021	9	0.036	75	0.018	211	0.011	63	0.004	323	0.015	73	0.006	223	0.011	354	0.004	146	0.004	323	0.011	63	0.004	323
CN		0.930	0.248	0.074	0.074	0.177	0.042	0.235	0.020	287	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286	0.010	286
CM		-0.074	0.054	0.221	0.013	0.320	0.007	0.30	0.006	60	0.006	77	0.004	146	0.006	235	0.001	32	0.006	235	0.001	32	0.006	235	0.001	32	0.006	235	0.001	32	0.006	235
DCP 1	-0.10	3.284	0.755	1.95	0.260	0.317	0.176	0.49	0.095	136	0.050	238	0.042	337	0.028	340	0.033	82	0.028	340	0.033	82	0.028	340	0.033	82	0.028	340	0.033	82	0.028	340
DCP 2	-0.20	2.896	0.726	1.96	0.433	0.229	0.203	0.53	0.106	122	0.052	201	0.054	328	0.024	37	0.016	85	0.024	37	0.016	85	0.024	37	0.016	85	0.024	37	0.016	85	0.024	37
DCP 3	-0.30	2.677	0.713	1.96	0.345	0.224	0.118	0.6	0.092	75	0.056	149	0.039	226	0.032	278	0.032	7	0.032	278	0.032	7	0.032	278	0.032	7	0.032	278	0.032	7	0.032	278
DCP 4	-0.40	1.986	0.534	1.95	0.300	0.238	0.197	0.14	0.045	45	0.029	127	0.023	194	0.021	213	0.016	295	0.021	213	0.016	295	0.021	213	0.016	295	0.021	213	0.016	295	0.021	213
DCP 5	-0.74	1.825	0.430	1.31	0.319	0.228	0.157	0.295	0.033	52	0.018	98	0.017	168	0.013	209	0.005	213	0.013	209	0.005	213	0.013	209	0.005	213	0.013	209	0.005	213	0.013	209
DCP 6	-0.99	1.728	0.374	1.15	0.278	0.216	0.154	0.285	0.032	50	0.013	74	0.011	152	0.010	183	0.017	240	0.010	183	0.017	240	0.010	183	0.017	240	0.010	183	0.017	240	0.010	183
DCP 7	-1.49	1.449	0.359	1.10	0.251	0.200	0.144	0.260	0.034	327	0.033	0	0.013	81	0.013	183	0.024	291	0.013	183	0.024	291	0.013	183	0.024	291	0.013	183	0.024	291	0.013	183
DCP 8	-2.00	1.248	0.338	1.08	0.216	0.199	0.127	0.251	0.044	303	0.047	346	0.014	75	0.014	183	0.034	291	0.014	183	0.034	291	0.014	183	0.034	291	0.014	183	0.034	291	0.014	183
DCP 9	-2.50	1.248	0.348	1.00	0.195	0.187	0.121	0.232	0.044	274	0.044	317	0.022	80	0.022	80	0.013	274	0.022	80	0.013	274	0.022	80	0.013	274	0.022	80	0.013	274	0.022	80
DCP 10	-3.00	1.126	0.320	0.91	0.158	0.171	0.095	0.216	0.043	246	0.035	290	0.021	339	0.021	339	0.018	179	0.021	339	0.018	179	0.021	339	0.018	179	0.021	339	0.018	179	0.021	339
DCP 11	-3.99	1.017	0.320	0.82	0.116	0.148	0.046	0.171	0.030	223	0.025	269	0.027	286	0.025	269	0.027	286	0.025	269	0.027	286	0.025	269	0.027	286	0.025	269	0.027	286	0.025	269
DCP 12	-5.01	0.844	0.294	0.67	0.083	0.118	0.038	0.163	0.033	238	0.017	258	0.030	252	0.017	258	0.030	252	0.017	258	0.030	252	0.017	258	0.030	252	0.017	258	0.030	252	0.017	258
DCP 13	-6.00	0.727	0.271	0.59	0.079	0.08	0.040	0.147	0.017	237	0.031	233	0.032	250	0.017	237	0.031	233	0.032	250	0.017	237	0.031	233	0.032	250	0.017	237	0.031	233	0.032	250
DCP 14	-7.01	0.624	0.256	0.51	0.080	0.72	0.034	0.130	0.012	183	0.020	210	0.021	241	0.012	183	0.020	210	0.021	241	0.012	183	0.020	210	0.021	241	0.012	183	0.020	210	0.021	241
DCP 15	-8.00	0.473	0.223	0.46	0.079	0.58	0.034	0.130	0.014	174	0.014	200	0.018	226	0.014	174	0.014	200	0.018	226	0.014	174	0.014	200	0.018	226	0.014	174	0.014	200	0.018	226
DCP 16	-9.00	0.221	0.150	0.47	0.050	0.53	0.032	0.134	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267
DCP 17	-9.99	0.053	0.073	0.46	0.030	0.43	0.012	0.153	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267	0.002	167	0.009	208	0.008	267

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.16	0.088	0.390	5.16	0.0	5.00	12015.5	20	
V	Q	RN	CHIMINI	CHIMAXI	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
134.3 (440.5)	34909. (729.1)	0.47E 07	-0.023	1.036	10.20	-0.00009	0.965	0.0	
HARMONIC ANALYSIS									
DATA	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA									
CM									
DCP 1	-0.10	2.851	3.344 349	0.232 290	0.036 195	0.057 228	0.061 148	0.073 65	0.014 344
DCP 2	-0.20	2.215	2.445 352	0.160 323	0.129 179	0.143 79	0.115 345	0.068 259	0.023 175
DCP 3	-0.30	2.038	1.980 351	0.131 22	0.039 330	0.009 234	0.003 305	0.007 251	0.002 149
DCP 4	-0.40	1.928	1.649 351	0.105 15	0.045 320	0.020 243	0.008 222	0.005 200	0.002 268
DCP 5	-0.74	1.732	1.329 351	0.087 13	0.023 323	0.008 227	0.004 270	0.003 206	0.003 291
DCP 6	-0.99	1.570	1.118 352	0.076 14	0.017 314	0.005 210	0.001 193	0.003 199	0.003 100
DCP 7	-1.49	1.446	0.841 353	0.049 12	0.015 309	0.007 202	0.010 316	0.005 266	0.003 100
DCP 8	-2.00	0.940	0.486 356	0.049 18	0.008 291	0.003 67	0.003 317	0.002 266	0.003 354
DCP 9	-2.50	0.809	0.584 354	0.043 4	0.004 269	0.004 158	0.002 5	0.002 252	0.003 355
DCP10	-3.00	0.723	0.484 355	0.039 21	0.008 261	0.001 56	0.002 4	0.001 28	0.003 355
DCP11	-3.99	0.638	0.382 1	0.035 28	0.007 263	0.001 50	0.001 36	0.004 321	0.003 355
DCP12	-5.01	0.438	0.295 3	0.027 28	0.007 263	0.001 50	0.005 44	0.006 256	0.003 355
DCP13	-6.00	0.344	0.211 7	0.026 34	0.009 256	0.003 118	0.005 86	0.009 307	0.007 78
DCP14	-7.01	0.344	0.132 11	0.030 44	0.010 256	0.001 178	0.005 21	0.003 322	0.003 112
DCP15	-8.00	0.173	0.073 23	0.022 41	0.008 279	0.004 193	0.005 51	0.003 322	0.001 344
DCP16	-9.00	0.067	0.037 33	0.006 45	0.006 232	0.004 222	0.005 51	0.002 162	0.003 85
DCP17	-9.99	-0.060	0.010 168	0.005 324	0.005 222	0.004 94	0.004 110	0.005 263	0.006 36

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.13	0.088	0.397	5.15	0.0	7.50	12015.6	20	
V	Q	RN	CHIMINI	CHIMAXI	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
133.8 (439.0)	34704. (724.8)	0.47E 07	-0.040	1.208	11.96	-0.00085	0.914	0.0	
HARMONIC ANALYSIS									
DATA	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA									
CM									
DCP 1	-0.10	3.581	1.750 351	1.053 68	0.703 350	0.405 269	0.104 202	0.045 279	0.007 227
DCP 2	-0.20	2.890	1.420 2	0.729 49	0.413 336	0.281 271	0.189 214	0.106 175	0.002 162
DCP 3	-0.30	2.754	1.328 0	0.560 46	0.313 329	0.213 256	0.149 194	0.116 140	0.001 85
DCP 4	-0.40	2.449	1.028 1	0.527 48	0.284 323	0.151 236	0.078 157	0.032 106	0.002 107
DCP 5	-0.74	2.161	0.841 3	0.419 40	0.225 309	0.129 215	0.067 127	0.024 65	0.016 56
DCP 6	-0.99	1.947	0.754 5	0.363 31	0.187 294	0.114 198	0.059 108	0.029 51	0.021 27
DCP 7	-1.49	1.455	0.640 6	0.254 20	0.141 273	0.087 169	0.053 77	0.011 352	0.052 341
DCP 8	-2.00	1.210	0.551 10	0.193 12	0.116 263	0.073 164	0.034 81	0.018 41	0.030 351
DCP 9	-2.50	1.061	0.518 7	0.147 350	0.084 230	0.060 123	0.024 38	0.015 353	0.026 354
DCP10	-3.00	0.935	0.434 8	0.118 349	0.068 217	0.049 105	0.019 351	0.009 302	0.025 217
DCP11	-3.99	0.769	0.345 13	0.092 355	0.050 218	0.038 102	0.018 328	0.007 316	0.011 301
DCP12	-5.01	0.556	0.248 19	0.079 358	0.035 208	0.033 86	0.018 315	0.005 282	0.016 278
DCP13	-6.00	0.441	0.165 50	0.067 11	0.023 210	0.024 79	0.018 328	0.004 282	0.009 255
DCP14	-7.01	0.379	0.098 50	0.055 18	0.017 190	0.027 57	0.019 289	0.005 235	0.003 235
DCP15	-8.00	0.203	0.072 43	0.025 348	0.023 198	0.021 43	0.010 279	0.004 263	0.003 116
DCP16	-9.00	-0.034	0.058 13	0.030 269	0.019 129	0.011 32	0.003 299	0.006 312	0.007 132
DCP17	-9.99	-0.053	0.022 12	0.019 269	0.003 184	0.005 122	0.002 223	0.006 330	0.009 168

FORCED PITCHING OSCILLATION										AIRFOIL NLR 1				CYCLES ANALYSED			
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	EXT DAMP									
0.0	23.12	0.008	0.397	5.11	0.0	10.00	12019.5	0.0									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI						
ALPHA		10.003	5.112 0	0.248 17	0.020 248	0.034 16	0.144 337	0.042 232	0.016 117	0.023 92	0.009 245						
CM		0.097	0.233 36	0.134 35	0.032 1	0.032 304	0.016 213	0.010 177	0.012 65	0.009 77	0.005 342						
CM		-0.014	0.032 211	0.026 99	0.007 48	0.012 37	0.010 314	0.003 284	0.005 252	0.004 246	0.002 163						
DCP 1	-0.10	4.007	0.146 323	1.304 81	0.224 84	0.544 72	0.281 5	0.064 50	0.106 3	0.073 58	0.057 4						
DCP 2	-0.20	3.251	0.303 37	0.832 77	0.296 64	0.315 49	0.254 3	0.091 354	0.154 6	0.094 329	0.087 348						
DCP 3	-0.30	3.021	0.233 42	0.802 60	0.362 48	0.284 13	0.149 326	0.071 325	0.074 310	0.083 287	0.071 261						
DCP 4	-0.40	2.756	0.293 43	0.681 67	0.184 22	0.125 16	0.109 323	0.037 261	0.049 338	0.049 280	0.030 245						
DCP 5	-0.74	2.421	0.322 44	0.529 58	0.135 15	0.116 5	0.101 302	0.039 244	0.041 299	0.043 227	0.017 194						
DCP 6	-0.99	2.164	0.350 45	0.450 52	0.104 9	0.110 354	0.107 286	0.045 224	0.025 276	0.033 204	0.014 175						
DCP 7	-1.49	1.463	0.380 38	0.314 40	0.087 358	0.104 328	0.080 256	0.030 210	0.018 232	0.011 188	0.020 216						
DCP 8	-2.00	1.351	0.354 38	0.244 41	0.092 3	0.104 322	0.080 256	0.031 210	0.018 232	0.011 188	0.020 216						
DCP 9	-2.50	1.221	0.340 34	0.203 20	0.045 337	0.082 295	0.074 217	0.036 172	0.030 134	0.027 174	0.022 160						
DCP10	-3.00	1.081	0.348 34	0.175 12	0.059 332	0.087 281	0.064 199	0.029 179	0.026 127	0.027 192	0.015 149						
DCP11	-3.99	0.901	0.312 35	0.128 6	0.038 324	0.064 255	0.046 146	0.017 147	0.010 85	0.024 58	0.016 7						
DCP12	-5.01	0.673	0.260 36	0.100 352	0.023 308	0.044 233	0.041 140	0.013 90	0.025 75	0.018 51	0.013 335						
DCP13	-6.00	0.549	0.209 40	0.075 359	0.013 176	0.031 213	0.036 114	0.009 52	0.019 44	0.014 51	0.013 341						
DCP14	-7.01	0.448	0.147 49	0.065 313	0.021 197	0.031 199	0.029 105	0.011 96	0.024 33	0.008 44	0.008 323						
DCP15	-8.00	0.266	0.128 34	0.061 286	0.019 197	0.031 199	0.029 105	0.011 96	0.024 33	0.008 44	0.008 323						
DCP16	-9.00	0.022	0.123 11	0.053 275	0.019 254	0.027 193	0.020 112	0.010 91	0.014 77	0.008 59	0.011 284						
DCP17	-9.69	-0.035	0.052 7	0.022 287	0.011 288	0.014 199	0.006 102	0.005 109	0.006 77	0.010 96	0.003 324						

HARMONIC ANALYSIS

FORCED PITCHING OSCILLATION										AIRFOIL NLR 1				CYCLES ANALYSED			
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	EXT DAMP									
0.0	23.14	0.008	0.396	5.05	0.0	12.47	12019.6	0.0									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI						
ALPHA		12.471	5.054 0	0.250 18	0.032 228	0.012 85	0.060 95	0.005 20	0.047 233	0.016 258	0.011 213						
CM		0.984	0.204 72	0.063 62	0.042 59	0.011 24	0.026 356	0.011 287	0.012 268	0.011 269	0.008 199						
CM		-0.028	0.059 203	0.021 120	0.018 152	0.006 94	0.012 118	0.006 51	0.003 84	0.003 106	0.002 26						
DCP 1	-0.10	4.379	1.265 109	0.816 110	0.543 163	0.210 165	0.181 175	0.036 199	0.098 196	0.036 250	0.040 174						
DCP 2	-0.20	3.456	0.700 109	0.695 108	0.316 150	0.321 132	0.166 166	0.118 154	0.153 205	0.074 218	0.073 230						
DCP 3	-0.30	3.072	0.851 104	0.652 96	0.312 146	0.331 113	0.129 111	0.155 119	0.073 132	0.067 145	0.050 135						
DCP 4	-0.40	2.875	0.585 145	0.361 90	0.289 123	0.093 74	0.087 123	0.048 56	0.037 201	0.031 185	0.048 176						
DCP 5	-0.74	2.518	0.465 134	0.300 89	0.255 108	0.082 62	0.091 92	0.048 36	0.028 118	0.016 66	0.030 114						
DCP 6	-0.99	2.288	0.398 117	0.259 84	0.232 97	0.077 49	0.094 77	0.052 25	0.026 98	0.023 67	0.043 75						
DCP 7	-1.49	1.788	0.335 90	0.207 73	0.137 70	0.052 26	0.080 51	0.039 311	0.019 68	0.021 350	0.013 46						
DCP 8	-2.00	1.471	0.295 87	0.189 75	0.113 70	0.048 53	0.070 41	0.031 17	0.028 7	0.014 348	0.015 47						
DCP 9	-2.50	1.316	0.324 73	0.171 59	0.119 47	0.048 9	0.067 21	0.040 354	0.031 338	0.028 320	0.017 327						
DCP10	-3.00	1.160	0.304 64	0.142 48	0.108 36	0.048 355	0.076 3	0.049 317	0.041 309	0.034 321	0.014 270						
DCP11	-3.99	1.001	0.304 56	0.089 38	0.104 34	0.038 329	0.067 355	0.049 284	0.040 294	0.028 309	0.025 256						
DCP12	-5.01	0.770	0.282 49	0.061 11	0.076 22	0.030 314	0.054 310	0.034 273	0.034 273	0.021 280	0.022 259						
DCP13	-6.00	0.623	0.251 45	0.054 329	0.050 4	0.023 279	0.043 314	0.029 253	0.021 285	0.011 264	0.019 216						
DCP14	-7.01	0.522	0.216 43	0.067 300	0.044 339	0.027 242	0.041 295	0.020 268	0.010 238	0.009 296	0.012 182						
DCP15	-8.00	0.337	0.204 28	0.066 290	0.045 321	0.019 232	0.045 280	0.027 196	0.011 223	0.010 273	0.012 164						
DCP16	-9.00	0.071	0.168 15	0.036 327	0.052 321	0.017 268	0.029 268	0.010 196	0.010 171	0.006 269	0.006 125						
DCP17	-9.69	-0.014	0.077 13	0.016 351	0.028 332	0.007 262	0.013 266	0.010 219	0.005 215	0.001 9	0.011 147						

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				NLR 1				CYCLES ANALYSED					
		TUNED MZ 0.0	DRIVE MZ 23.14	K 0.009	MACH NO 0.306	DEL-ALPHA 5.08	DEL-M 0.0	ALPHA-0 19.94	TEST POINT 12019.9	RES 0 PHI	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
V	332.5 (836.1)	Q 3488. (720.3)	RN 0.47E 07	CHIMING -0.160	CHIMAX 1.2	ALPHA-MAX 19.50	AERO DAMP -0.00348	TOR 3.711	EST DAMP 0.0	HARMONIC ANALYSIS									
										RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA CN CM										19.945	5.001 0	0.228 8	0.048 254	0.008 198	0.024 35	0.012 04	0.034 177	0.018 144	0.089 324
										0.999	0.196 85	0.031 118	0.016 113	0.016 83	0.008 137	0.005 1	0.007 119	0.006 131	0.001 296
										-0.009	0.048 248	0.010 247	0.006 284	0.004 233	0.002 292	0.002 166	0.032 244	0.001 284	0.001 199
	010		0.464 157	0.184 265	0.139 43	0.110 136	0.095 247	0.083 77	0.024 185	0.005 308	0.007 20	0.004 196	0.007 20	0.012 147	0.005 81	0.015 368	0.019 42	0.012 7	
	020		0.366 146	0.135 257	0.066 146	0.052 124	0.013 221	0.005 78	0.016 252	0.007 113	0.004 156	0.007 20	0.012 147	0.005 81	0.015 368	0.019 42	0.012 7		
	030		2.039 137	0.185 247	0.082 332	0.053 78	0.011 218	0.007 113	0.016 252	0.007 113	0.004 156	0.007 20	0.012 147	0.005 81	0.015 368	0.019 42	0.012 7		
	040		2.379 170	0.090 142	0.074 274	0.013 0	0.028 83	0.024 230	0.017 153	0.006 273	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	050		2.222 159	0.074 274	0.056 253	0.015 271	0.014 79	0.006 273	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	060		2.135 121	0.122 129	0.079 237	0.025 265	0.007 162	0.017 22	0.011 139	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	070		1.673 68	0.077 145	0.041 132	0.023 22	0.019 206	0.007 60	0.022 179	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	080		1.336 149	0.024 194	0.019 118	0.021 145	0.003 32	0.004 244	0.002 179	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	090		1.265 81	0.036 158	0.029 143	0.019 107	0.002 129	0.007 62	0.018 133	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	100		1.191 259	0.039 149	0.025 127	0.019 119	0.006 129	0.007 50	0.012 149	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	110		1.094 265	0.039 135	0.035 104	0.018 185	0.003 39	0.005 159	0.012 149	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	120		0.933 256	0.035 112	0.028 89	0.036 86	0.003 27	0.005 159	0.012 149	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	130		0.806 243	0.045 86	0.031 97	0.032 85	0.003 24	0.005 159	0.012 149	0.006 130	0.007 249	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	0.006 327	
	140		0.711 225	0.050 72	0.050 71	0.027 47	0.008 103	0.008 332	0.016 76	0.008 125	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	
150		0.565 195	0.051 64	0.025 124	0.015 27	0.008 114	0.010 345	0.014 56	0.010 125	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349	0.013 349		
160		0.433 173	0.031 55	0.013 96	0.007 317	0.005 346	0.011 332	0.009 41	0.011 332	0.009 41	0.009 41	0.009 41	0.009 41	0.009 41	0.009 41	0.009 41	0.009 41		
170		0.056 062	0.062 78	0.012 77	0.007 75	0.005 301	0.002 345	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317	0.005 317		

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				MUR I	CYCLES ANALYSED											
		TUNED MZ 0.0	DRIVE MZ 23.06	K 0.086	MACH NO 0.403	DEL-ALPHA 5.15	DEL-M 3.0	ALPHA-0 0.33	TEST POINT 12019.1		RES 0 PHI	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI		
ALPHA CN	V 136.4 (447.5)	Q 48220. (1007.1)	RN	CMIN(M) -0.029	CMAX(M) 0.595	ALPHA-MAX 5.13	AERO DAMP -0.0069	TOR 0.750	EXT DAMP 0.0	TEST POINT 12019.1	RES 0 PHI	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI		
DEP 1	0.010	-0.754	3.446	348	0.287	34	0.079	123	0.013	158	0.011	142	0.013	190	0.013	190	0.013	190	0.013	190	0.013	190
DEP 2	0.020	-0.337	2.438	350	0.094	337	0.020	331	0.012	35	0.009	132	0.007	181	0.007	181	0.007	181	0.007	181	0.007	181
DEP 3	0.030	-0.046	2.045	350	0.079	325	0.010	360	0.011	337	0.002	187	0.002	187	0.002	187	0.002	187	0.002	187	0.002	187
DEP 4	0.040	0.170	1.674	351	0.082	325	0.005	350	0.003	304	0.002	231	0.002	227	0.002	227	0.002	227	0.002	227	0.002	227
DEP 5	0.074	0.327	1.345	351	0.049	330	0.007	22	0.001	292	0.001	241	0.002	238	0.002	238	0.002	238	0.002	238	0.002	238
DEP 6	0.099	0.364	1.163	351	0.043	339	0.009	349	0.004	247	0.005	187	0.004	16	0.004	16	0.004	16	0.004	16	0.004	16
DEP 7	0.149	0.247	0.869	352	0.033	343	0.002	7	0.003	338	0.001	165	0.003	23	0.003	23	0.003	23	0.003	23	0.003	23
DEP 8	0.200	0.209	0.712	355	0.029	355	0.003	356	0.001	166	0.001	252	0.002	107	0.002	107	0.002	107	0.002	107	0.002	107
DEP 9	0.250	0.186	0.621	353	0.019	1	0.004	291	0.002	248	0.003	319	0.002	244	0.002	244	0.002	244	0.002	244	0.002	244
DEP 10	0.300	0.107	0.521	354	0.019	1	0.005	5	0.002	200	0.004	337	0.004	315	0.004	315	0.004	315	0.004	315	0.004	315
DEP 11	0.399	0.169	0.420	359	0.015	18	0.005	18	0.003	56	0.004	44	0.003	315	0.003	315	0.003	315	0.003	315	0.003	315
DEP 12	0.501	0.117	0.318	0	0.010	1	0.005	56	0.002	53	0.001	348	0.001	310	0.001	310	0.001	310	0.001	310	0.001	310
DEP 13	0.600	0.137	0.245	2	0.007	349	0.002	68	0.004	55	0.005	58	0.001	330	0.002	27	0.002	27	0.002	27	0.002	27
DEP 14	0.701	0.193	0.173	3	0.004	69	0.002	30	0.003	133	0.002	324	0.002	285	0.002	285	0.002	285	0.002	285	0.002	285
DEP 15	0.800	0.090	0.101	7	0.003	114	0.000	308	0.001	70	0.003	286	0.001	300	0.003	244	0.003	244	0.003	244	0.003	244
DEP 16	0.900	-0.006	0.031	10	0.003	211	0.003	336	0.002	8	0.002	30	0.001	93	0.003	114	0.003	114	0.003	114	0.003	114
DEP 17	0.969	-0.042	0.021	180	0.003	165	0.005	204	0.002	113	0.002	322	0.001	190	0.003	336	0.003	336	0.003	336	0.003	336

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
AIRFOIL					AIRFOIL				
NLR 1					NLR 1				
TUNED HZ	DRIVE HZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.06	0.087	0.400	5.16	0.0	2.49	12019.2	20	
V	Q	BN	CHINING	CHINING	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
135.2	47622.	0.04E 07	-0.022	0.035	7.53	-0.037%	3.799	0.0	
(443.5)	(994.6)								
HARMONIC ANALYSIS									
DATA TYPE	R/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		5.159	0	0.207	11	0.041	268	0.001	31
CH		0.477	354	0.018	8	0.002	344	0.002	206
CM		0.012	307	0.001	200	0.000	10	0.000	149
DCP 1	-0.010	3.170	348	0.156	355	0.039	135	0.021	237
DCP 2	-0.020	2.465	350	0.079	351	0.009	346	0.011	181
DCP 3	-0.030	1.810	350	0.075	349	0.012	326	0.009	203
DCP 4	-0.040	1.053	350	0.049	351	0.005	243	0.006	190
DCP 5	-0.050	1.727	350	0.049	343	0.009	190	0.005	209
DCP 6	-0.060	1.039	351	0.043	357	0.015	333	0.004	163
DCP 7	-0.070	1.170	351	0.043	357	0.015	333	0.004	163
DCP 8	-0.080	0.762	352	0.052	356	0.005	337	0.006	158
DCP 9	-0.090	0.717	354	0.050	356	0.005	337	0.006	158
DCP 10	-0.100	0.620	353	0.027	354	0.004	289	0.004	262
DCP 11	-0.110	0.516	354	0.021	354	0.004	289	0.004	262
DCP 12	-0.120	0.415	359	0.018	350	0.001	89	0.002	256
DCP 13	-0.130	0.315	0	0.015	35	0.004	326	0.001	325
DCP 14	-0.140	0.254	0.243	0.011	30	0.002	333	0.001	325
DCP 15	-0.150	0.275	0.105	0.011	30	0.002	333	0.001	325
DCP 16	-0.160	0.097	6	0.004	60	0.003	111	0.004	350
DCP 17	-0.170	0.036	16	0.001	327	0.003	289	0.004	141
DCP 18	-0.180	0.016	176	0.008	251	0.002	66	0.003	278

FORCED PITCHING OSCILLATION									
AIRFOIL					AIRFOIL				
NLR 1					NLR 1				
TUNED HZ	DRIVE HZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.11	0.088	0.390	5.16	0.0	4.96	1.019.3	20	
V	Q	BN	CHINING	CHINING	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP	
134.2	47105.	0.04E 07	-0.022	0.035	10.14	-0.00099	0.956	0.0	
(440.4)	(983.8)								
HARMONIC ANALYSIS									
DATA TYPE	R/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		5.162	0	0.239	9	0.039	235	0.013	21
CH		0.456	355	0.034	19	0.007	280	0.002	166
CM		0.016	315	0.004	243	0.001	87	0.001	336
DCP 1	-0.010	3.464	349	0.280	287	0.061	176	0.061	233
DCP 2	-0.020	2.431	351	0.133	344	0.007	194	0.007	193
DCP 3	-0.030	1.809	351	0.126	21	0.039	327	0.016	237
DCP 4	-0.040	1.040	351	0.099	14	0.048	325	0.014	248
DCP 5	-0.050	1.330	351	0.078	11	0.038	315	0.009	256
DCP 6	-0.060	1.129	352	0.073	17	0.017	313	0.006	237
DCP 7	-0.070	0.845	353	0.054	11	0.012	286	0.002	255
DCP 8	-0.080	0.792	353	0.045	20	0.003	267	0.001	245
DCP 9	-0.090	0.492	355	0.044	14	0.003	237	0.002	229
DCP 10	-0.100	0.389	1	0.038	22	0.004	200	0.004	116
DCP 11	-0.110	0.298	2	0.025	31	0.006	206	0.003	171
DCP 12	-0.120	0.218	5	0.023	38	0.005	206	0.002	194
DCP 13	-0.130	0.151	10	0.024	42	0.004	189	0.002	113
DCP 14	-0.140	0.078	19	0.023	49	0.008	277	0.004	189
DCP 15	-0.150	0.027	27	0.011	38	0.003	235	0.003	117
DCP 16	-0.160	0.012	157	0.005	336	0.002	165	0.006	132

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION										
AIRFOIL					AIRFOIL					
NLR 1					NLR 1					
TUNED HZ	DRIVE HZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-O	TEST POINT	CYCLES ANALYSED		
0.0	23.15	0.000	0.390	5.16	0.0	7.48	12019.4	20		
HARMONIC ANALYSIS										
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA	7.476	5.161	0	0.029	0.023	0.020	0.009	0.017	0.001	0.005
CN	0.708	0.336	0	0.042	0.016	0.004	0.002	0.005	0.005	0.001
CN	0.001	0.016	0.005	0.008	0.007	0.004	0.002	0.000	0.002	0.001
DCP 1	3.830	2.150	0.641	0.720	0.414	0.127	0.033	0.007	0.004	0.047
DCP 2	3.001	1.739	0.527	0.272	0.215	0.200	0.119	0.010	0.042	0.002
DCP 3	2.903	1.609	0.421	0.214	0.139	0.200	0.082	0.010	0.042	0.002
DCP 4	2.903	1.609	0.421	0.214	0.139	0.200	0.082	0.010	0.042	0.002
DCP 5	2.903	1.608	0.372	0.168	0.087	0.053	0.034	0.027	0.020	0.015
DCP 6	2.903	1.008	0.295	0.143	0.078	0.054	0.034	0.022	0.021	0.014
DCP 7	2.904	0.833	0.265	0.124	0.074	0.050	0.034	0.023	0.009	0.010
DCP 8	1.416	0.636	0.205	0.100	0.059	0.032	0.019	0.012	0.007	0.003
DCP 9	1.204	0.542	0.165	0.084	0.051	0.032	0.019	0.011	0.007	0.003
DCP 10	1.044	0.477	0.144	0.074	0.049	0.028	0.018	0.011	0.007	0.003
DCP 11	0.911	0.366	0.126	0.059	0.039	0.024	0.015	0.009	0.006	0.003
DCP 12	0.740	0.259	0.110	0.050	0.034	0.020	0.015	0.009	0.006	0.003
DCP 13	0.540	0.230	0.089	0.036	0.023	0.018	0.010	0.007	0.006	0.003
DCP 14	0.436	0.153	0.078	0.030	0.024	0.015	0.008	0.007	0.006	0.003
DCP 15	0.383	0.068	0.048	0.020	0.021	0.019	0.011	0.004	0.006	0.003
DCP 16	0.282	0.082	0.068	0.019	0.025	0.022	0.007	0.004	0.006	0.003
DCP 17	-0.032	0.093	0.125	0.025	0.017	0.004	0.001	0.004	0.012	0.002
DCP 18	-0.032	0.013	0.13	0.019	0.003	0.003	0.001	0.001	0.015	0.002

FORCED PITCHING OSCILLATION											
AIRFOIL					AIRFOIL						
NLR 1					NLR 1						
TUNED HZ	DRIVE HZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-O	TEST POINT	CYCLES ANALYSED			
0.0	23.08	0.008	0.390	5.11	0.0	9.90	12019.5	20			
HARMONIC ANALYSIS											
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	
ALPHA	0.950	5.111	0	0.015	207	0.036	4	0.046	316	0.038	183
CN	0.902	0.231	37	0.135	32	0.031	314	0.017	209	0.009	134
CN	-0.000	0.025	228	0.015	103	3.009	22	0.007	35	0.004	262
Q	46750.			CN(H)		ALPHA(H)		ALPHA(O)		ALPHA(O)	
133.4	(437.6)			0.036	07	-0.000		-0.00127		9.90	
V				0.036	07	-0.000		FOR	EXT DAMP	0.0	
								1.350			
DCP 1	0.416	0.000	333	1.519	90	0.119	42	0.103	65	0.110	21
DCP 2	3.567	0.009	11	0.775	76	0.325	50	0.072	0	0.102	334
DCP 3	3.231	0.522	11	0.697	80	0.396	47	0.337	267	0.090	255
DCP 4	2.919	0.499	30	0.649	50	0.211	2	0.004	281	0.031	303
DCP 5	2.992	0.398	36	0.526	53	0.038	336	0.054	239	0.032	248
DCP 6	2.176	0.349	43	0.432	50	0.095	359	0.078	276	0.014	240
DCP 7	1.644	0.344	41	0.318	38	0.073	334	0.046	260	0.030	261
DCP 8	1.350	0.337	39	0.249	39	0.040	351	0.037	249	0.001	229
DCP 9	1.241	0.317	35	0.187	21	0.027	334	0.030	177	0.006	104
DCP 10	1.061	0.310	36	0.134	11	0.027	300	0.033	154	0.011	150
DCP 11	0.873	0.287	40	0.107	11	0.023	292	0.014	102	0.021	101
DCP 12	0.661	0.214	40	0.087	354	0.013	279	0.010	115	0.015	81
DCP 13	0.522	0.187	49	0.082	395	0.013	241	0.019	116	0.012	95
DCP 14	0.441	0.137	42	0.049	326	0.023	271	0.022	65	0.016	31
DCP 15	0.250	0.115	43	0.062	299	0.016	248	0.019	55	0.013	341
DCP 16	0.015	0.109	15	0.056	278	0.017	218	0.026	24	0.004	195
DCP 17	-0.036	0.053	8	0.032	281	0.025	199	0.017	395	0.005	269
DCP 18						0.041	201	0.010	76	0.006	342
DCP 19						0.087	110	0.010	20	0.004	271
DCP 20											

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.92	0.085	0.408	5.05	0.0	12.00	12021.1	20	0.0
Y	Q	SN	CM(MIN)	CM(MAX)	ALPHA-MAX	AERU DAMP	TDR	EXT DAMP	
13.7	49125.	0.65E 07	-0.110	1.337	14.49	-0.00163	1.802	0.0	
(431.9)	(-0.26.0)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
TYPE	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
OC1 4	0.010	0.932 154	0.718 106	0.461 175	0.247 165	0.146 157	0.132 187	0.033 232	0.067 220
OC1 5	0.010	0.430 187	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 6	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 7	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 8	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 9	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 10	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 11	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 12	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 13	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 14	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 15	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 16	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213
OC1 17	0.010	0.442 168	0.226 105	0.141 142	0.075 140	0.040 162	0.024 185	0.005 271	0.012 213

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	23.01	0.086	0.404	5.01	0.0	15.02	12021.2	20	0.0
Y	Q	SN	CM(MIN)	CM(MAX)	ALPHA-MAX	AERU DAMP	TDR	EXT DAMP	
136.2	48321.	0.64E 07	-0.120	1.295	14.56	-0.00178	1.947	0.0	
(447.0)	(1009.2)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
TYPE	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
OC1 1	0.010	1.493 186	0.159 231	0.173 150	0.164 258	0.055 4	0.051 30	0.068 40	0.026 49
OC1 2	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 3	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 4	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 5	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 6	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 7	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 8	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 9	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 10	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 11	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 12	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 13	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 14	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 15	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 16	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71
OC1 17	0.010	1.111 165	0.323 167	0.453 144	0.146 283	0.111 358	0.061 65	0.078 41	0.025 71

FORCED PITCHING OSCILLATION										AIRFOIL										MUR 1										CYCLES ANALYSED										
DATA	TUNED MZ	DRIVE MZ	K	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	DEL-ALPHA	DEL-M	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0		
TYPE	0.0	23.01	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
ALPHA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
CM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
DCP 1	0.010	2.947	3.486	349	0.271	387	0.050	167	0.074	232	0.092	143	0.058	52	0.027	340	0.014	336	0.021	277	0.005	119	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141
DCP 2	0.020	2.205	2.449	351	0.151	351	0.044	192	0.073	265	0.091	146	0.035	251	0.023	155	0.021	152	0.005	119	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141	0.002	141
DCP 3	0.030	2.063	2.026	351	0.126	21	0.039	337	0.021	247	0.011	149	0.005	251	0.003	84	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251	0.005	251
DCP 4	0.040	1.938	1.703	351	0.101	18	0.032	332	0.019	249	0.008	136	0.003	147	0.003	26	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278	0.005	278
DCP 5	0.050	1.751	1.336	351	0.076	11	0.028	324	0.009	234	0.001	149	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147
DCP 6	0.060	1.574	1.137	352	0.075	19	0.017	324	0.007	213	0.002	113	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147	0.003	147
DCP 7	0.070	1.449	1.156	0.852	0.055	11	0.011	299	0.001	213	0.002	35	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 8	0.080	8.936	0.696	353	0.049	21	0.005	350	0.002	168	0.003	42	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 9	0.090	0.812	0.597	354	0.046	17	0.009	268	0.003	131	0.004	305	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 10	0.100	0.729	0.494	355	0.037	17	0.009	268	0.003	131	0.004	305	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 11	0.110	0.603	0.390	0	0.033	27	0.008	269	0.003	151	0.002	27	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 12	0.120	0.445	0.299	2	0.029	35	0.008	269	0.003	151	0.002	27	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 13	0.130	0.373	0.221	5	0.029	39	0.007	278	0.003	143	0.001	80	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 14	0.140	0.359	0.139	9	0.031	44	0.007	310	0.003	146	0.002	120	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 15	0.150	0.177	0.078	16	0.025	43	0.007	303	0.003	162	0.002	33	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284	0.003	284
DCP 16	0.160	0.055	0.030	22	0.009	18	0.005	273	0.002	185	0.002	152	0.001	266	0.002	117	0.012	261	0.002	117	0.012	261	0.002	117	0.012	261	0.002	117	0.012	261	0.002	117	0.012	261	0.002	117	0.012	261	0.002	117
DCP 17	0.170	0.059	0.014	162	0.007	321	0.003	336	0.003	150	0.004	26	0.003	271	0.002	205	0.009	279	0.002	205	0.009	279	0.002	205	0.009	279	0.002	205	0.009	279	0.002	205	0.009	279	0.002	205	0.009	279	0.002	205

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION													
TUNED MZ		DRIVE MZ		K		MACH NO		DEL-ALPHA		AIRFOIL		MLR 1	
0.0		23.08		0.007		0.400		5.00		DEL-H		ALPHA-0	
V		Q		RN		CHIMINI		CHIMAXI		ALPHA-MMAX		AERO DAMP	
134.8		52266.		0.70E 07		-0.115		1.316		15.04		-0.00176	
(442.3)		(1091.6)										TDR	
												1.903	
												0.0	
												EST DAMP	
												0.0	
HARMONIC ANALYSIS													
DATA	K/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	RES 10 PHI	CYCLES ANALYSED
ALPHA		15.029	4.997 0	0.217 7	0.047 183	0.024 213	0.018 298	0.030 156	0.020 272	0.031 37	0.003 133	0.003 133	
CM		0.961	0.235 96	0.057 146	0.012 94	0.038 108	0.003 69	0.007 124	0.012 37	0.010 31	0.003 112	0.003 112	
CM		-0.042	0.069 198	0.010 204	0.011 178	0.011 219	0.005 239	0.002 211	0.004 213	0.004 231	0.001 257	0.001 257	
DCP 1	-010	4.536	1.723 182	0.240 248	0.162 240	0.114 327	0.078 29	0.071 59	0.073 71	0.036 84	0.055 131	0.055 131	
DCP 2	-020	3.616	1.142 163	0.421 162	0.242 235	0.115 274	0.093 3	0.078 64	0.058 61	0.030 116	0.036 123	0.036 123	
DCP 3	-030	3.218	1.031 171	0.375 159	0.376 213	0.241 201	0.144 275	0.113 270	0.059 336	0.049 360	0.007 116	0.007 116	
DCP 4	-049	2.717	1.109 153	0.324 143	0.232 154	0.153 161	0.042 200	0.043 203	0.014 2	0.032 7	0.009 339	0.009 339	
DCP 5	-074	2.273	0.959 144	0.189 165	0.159 147	0.116 169	0.039 214	0.057 209	0.018 298	0.029 321	0.008 324	0.008 324	
DCP 6	-099	2.027	0.773 136	0.160 186	0.129 129	0.097 147	0.020 259	0.050 143	0.011 298	0.015 332	0.008 296	0.008 296	
DCP 7	-149	1.616	0.537 118	0.148 182	0.071 104	0.085 150	0.034 257	0.031 146	0.005 308	0.021 319	0.001 312	0.001 312	
DCP 8	-200	1.412	0.510 106	0.133 164	0.045 107	0.082 142	0.027 220	0.023 149	0.007 69	0.017 313	0.005 1	0.005 1	
DCP 9	-250	1.306	0.363 96	0.111 134	0.040 77	0.082 125	0.020 178	0.014 133	0.009 217	0.007 235	0.007 215	0.007 215	
DCP10	-300	1.173	0.317 85	0.097 128	0.031 43	0.081 111	0.006 147	0.017 133	0.008 149	0.006 165	0.007 183	0.007 183	
DCP11	-399	1.011	0.284 59	0.070 119	0.021 40	0.074 98	0.019 114	0.013 78	0.013 78	0.011 104	0.009 183	0.009 183	
DCP12	-501	0.815	0.267 55	0.041 111	0.023 2	0.056 77	0.017 100	0.016 78	0.024 67	0.017 69	0.011 98	0.011 98	
DCP13	-600	0.647	0.250 47	0.015 128	0.030 356	0.047 62	0.017 67	0.011 36	0.027 43	0.015 52	0.004 120	0.004 120	
DCP14	-701	0.551	0.231 40	0.009 299	0.044 351	0.044 4	0.016 50	0.010 5	0.023 32	0.020 53	0.003 14	0.003 14	
DCP15	-800	0.379	0.235 27	0.026 24	0.044 348	0.039 8	0.017 43	0.009 342	0.016 26	0.017 39	0.004 95	0.004 95	
DCP16	-900	0.127	0.179 18	0.050 40	0.020 46	0.027 16	0.016 32	3.004 57	0.016 354	0.013 48	0.009 70	0.009 70	
DCP17	-969	0.018	0.061 18	0.032 41	0.011 49	0.016 17	0.006 19	3.003 108	0.009 350	0.014 40	0.007 12	0.007 12	

FORCED PITCHING OSCILLATION											
TUNED MZ		K		MACH NO		DEL-ALPHA		DEL-H			
0.0		0.008		0.397		5.01		0.0			
V		RN		CHIMINI		CHIMAXI		ALPHA-MAX			
133.7		0.70E 07		-0.130		1.274		15.19			
(438.8)		Q		51538.		ALPHA-0		AERO DAMP			
		(1076.4)				17.46		-0.00235			
HARMONIC ANALYSIS											
DATA	K/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA		17.445	5.011 0	0.198 2	0.037 251	0.018 339	0.022 355	0.020 100	0.022 287	0.010 248	0.012 331
CM		0.945	0.203 92	0.052 129	0.031 196	0.015 224	0.011 231	0.012 247	0.002 16	0.014 253	0.002 120
CM		-0.064	0.064 206	0.024 238	0.006 283	0.005 328	0.002 20	0.003 30	0.002 96	0.005 46	0.001 197
DCP 1	-010	3.954	1.680 191	0.371 274	0.234 9	0.092 345	0.040 96	0.042 318	0.020 195	0.048 255	0.021 330
DCP 2	-020	3.178	1.415 160	0.187 220	0.197 315	0.082 11	0.091 76	0.012 260	0.028 225	0.028 312	0.018 291
DCP 3	-030	2.812	1.346 171	0.217 264	0.244 244	0.239 335	0.023 8	0.049 35	0.052 161	0.027 205	0.040 213
DCP 4	-049	2.416	1.021 136	0.327 239	0.184 209	0.094 282	0.025 254	0.019 257	0.024 121	0.018 204	0.05 171
DCP 5	-074	2.032	0.744 142	0.388 212	0.098 211	0.078 250	0.022 296	0.007 327	0.024 84	0.005 178	0.015 173
DCP 6	-099	1.831	0.551 129	0.261 205	0.070 229	0.041 231	0.019 267	0.011 337	0.013 63	0.005 235	0.004 145
DCP 7	-149	1.521	0.369 103	0.171 183	0.059 218	0.022 262	0.010 282	0.018 316	0.011 54	0.005 59	0.010 108
DCP 8	-200	1.350	0.302 95	0.140 167	0.065 213	0.037 275	0.021 272	0.027 294	0.016 334	0.012 314	0.002 329
DCP 9	-250	1.261	0.275 85	0.129 136	0.076 192	0.027 230	0.019 234	0.020 245	0.013 356	0.016 331	0.009 188
DCP10	-300	1.164	0.262 78	0.115 115	0.076 184	0.027 219	0.030 234	0.020 244	0.003 12	0.027 301	0.006 130
DCP11	-399	1.030	0.254 66	0.108 97	0.055 165	0.023 205	0.022 220	0.019 244	0.003 290	0.025 271	0.003 109
DCP12	-C1	0.856	0.244 53	0.102 80	0.039 145	0.018 205	0.010 216	0.015 233	0.004 329	0.024 257	0.008 64
DCP13	-600	0.717	0.251 48	0.091 74	0.027 144	0.014 168	0.004 187	0.011 225	0.005 257	0.025 222	0.006 44
DCP14	-701	0.606	0.242 39	0.078 63	0.019 102	0.021 156	0.004 153	0.015 205	0.004 201	0.024 206	0.004 44
DCP15	-800	0.455	0.223 35	0.07	0.020 77	0.024 140	0.008 134	0.010 191	0.003 227	0.017 189	0.004 288
DCP16	-900	0.194	0.143 40	0.053 47	0.011 74	0.016 139	0.002 134	0.007 145	0.003 235	0.010 202	0.004 280
DCP17	-969	0.048	0.060 52	0.025 48	0.004 52	0.002 163	0.005 206				

FORCED PITCHING OSCILLATION									
TUNED MZ		K		MACH NO		DEL-ALPHA		DEL-M	
0.0		0.171		0.399		5.43		0.0	
V		0		0.64E 07		CN(MIN)		ALPHA-MAX	
134.2		47224.		-0.031		1.263		12.65	
(440.3)		(986.3)							
HARMONIC ANALYSIS									
DATA	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA									
CN									
DCP 1	-0.10	3.542	1.686 354	0.915 48	0.734 325	0.345 227	0.030 29	0.157 225	0.119 115
DCP 2	-0.20	2.929	1.648 4	0.596 30	0.364 313	0.214 234	0.117 186	0.104 150	0.085 95
DCP 3	-0.30	2.844	1.670 2	0.419 7	0.249 284	0.179 196	0.107 117	0.053 68	0.042 24
DCP 4	-0.40	2.585	1.441 2	0.311 356	0.139 258	0.083 163	0.034 53	0.038 36	0.033 309
DCP 5	-0.74	2.276	1.160 4	0.254 348	0.114 237	0.075 116	0.033 19	0.013 161	0.037 305
DCP 6	-0.99	1.999	0.972 6	0.220 347	0.094 229	0.060 113	0.020 14	0.007 53	0.048 285
DCP 7	-1.49	1.476	0.760 9	0.179 341	0.078 213	0.050 99	0.011 359	0.007 125	0.038 268
DCP 8	-2.00	1.212	0.634 15	0.140 337	0.061 200	0.038 78	0.018 289	0.013 144	0.019 228
DCP 9	-2.50	1.052	0.483 12	0.104 296	0.048 144	0.037 52	0.016 272	0.008 182	0.016 247
DCP 10	-3.00	0.920	0.381 10	0.079 299	0.050 136	0.020 29	0.016 191	0.007 20	0.005 13
DCP 11	-3.99	0.739	0.303 30	0.048 305	0.040 131	0.016 49	0.012 244	0.006 283	0.003 18
DCP 12	-5.01	0.549	0.235 45	0.030 323	0.036 130	0.013 49	0.011 213	0.005 224	0.002 117
DCP 13	-6.00	0.432	0.176 65	0.021 325	0.028 120	0.006 315	0.007 186	0.005 292	0.002 132
DCP 14	-7.01	0.371	0.126 67	0.023 301	0.030 94	0.009 283	0.008 163	0.005 292	0.002 132
DCP 15	-8.00	0.196	0.061 43	0.033 228	0.021 60	0.023 182	0.001 245	0.003 164	0.003 37
DCP 16	-9.00	-0.036	0.016 35	0.015 236	0.010 91	0.020 183	0.001 348	0.003 157	0.003 37
DCP 17	-9.99	-0.058						0.003 157	0.003 249
HARMONIC ANALYSIS									
DATA	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA									
CN									
DCP 1	-0.10	4.113	1.364 11	0.795 63	0.407 9	0.188 347	0.139 325	0.092 249	0.052 254
DCP 2	-0.20	3.258	0.871 32	0.420 56	0.236 348	0.160 301	0.088 309	0.059 280	0.032 254
DCP 3	-0.30	2.946	0.757 42	0.309 39	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254
DCP 4	-0.40	2.774	0.845 37	0.209 39	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254
DCP 5	-0.74	2.415	0.757 42	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 6	-0.99	2.132	0.714 44	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 7	-1.49	1.646	0.687 39	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 8	-2.00	1.363	0.629 42	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 9	-2.50	1.175	0.593 35	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 10	-3.00	1.046	0.544 34	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 11	-3.99	0.866	0.482 40	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 12	-5.01	0.634	0.409 41	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 13	-6.00	0.522	0.342 47	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 14	-7.01	0.442	0.296 52	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 15	-8.00	0.355	0.255 57	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 16	-9.00	0.275	0.215 62	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254
DCP 17	-9.99	0.205	0.175 67	0.160 301	0.088 309	0.059 280	0.032 254	0.032 254	0.032 254

[illegible]

FORCED PITCHING OSCILLATION									
TUNED HZ		DRIVE HZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	ALPHA-0	TEST POINT
0.0		49.63	0.183	0.404	5.59	0.0	5.83	12079.1	20
HARMONIC ANALYSIS									
DATA TYPE	R/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		5.834	0.591	0.303	0.107	0.038	0.023	0.024	0.015
CN		0.711	0.375	0.035	0.008	0.006	0.002	0.001	0.001
CM		0.006	0.026	0.002	0.001	0.001	0.001	0.001	0.001
DCP 1	-010	3.071	2.012	0.161	0.056	0.023	0.014	0.007	0.002
DCP 2	-020	2.652	1.893	0.134	0.034	0.013	0.003	0.002	0.001
DCP 3	-030	2.549	1.616	0.134	0.027	0.013	0.004	0.002	0.001
DCP 4	-040	2.401	1.342	0.133	0.025	0.014	0.004	0.002	0.001
DCP 5	-074	2.167	1.059	0.120	0.026	0.014	0.004	0.002	0.001
DCP 6	-099	2.022	0.870	0.103	0.026	0.014	0.004	0.002	0.001
DCP 7	-149	1.544	0.652	0.050	0.019	0.007	0.002	0.001	0.001
DCP 8	-200	1.359	0.524	0.046	0.017	0.007	0.002	0.001	0.001
DCP 9	-250	1.211	0.448	0.040	0.016	0.007	0.002	0.001	0.001
DCP10	-300	0.823	0.347	0.034	0.011	0.003	0.001	0.001	0.001
DCP11	-350	0.593	0.283	0.024	0.008	0.003	0.001	0.001	0.001
DCP12	-401	0.459	0.218	0.024	0.008	0.003	0.001	0.001	0.001
DCP13	-400	0.394	0.218	0.023	0.008	0.003	0.001	0.001	0.001
DCP14	-701	0.373	0.204	0.023	0.008	0.003	0.001	0.001	0.001
DCP15	-800	0.191	0.094	0.012	0.003	0.001	0.001	0.001	0.001
DCP16	-800	-0.037	0.041	0.006	0.002	0.001	0.001	0.001	0.001
DCP17	-969	-0.039	0.024	0.006	0.002	0.001	0.001	0.001	0.001

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED HZ		DRIVE HZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	ALPHA-0	TEST POINT
0.0		49.70	0.187	0.402	5.57	0.0	7.51	12079.2	70
HARMONIC ANALYSIS									
DATA TYPE	R/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		5.570	0.423	0.194	0.083	0.021	0.012	0.007	0.003
CN		0.773	0.423	0.093	0.021	0.012	0.007	0.003	0.001
CM		-0.002	0.020	0.011	0.013	0.008	0.003	0.001	0.001
DCP 1	-010	3.496	2.102	0.153	0.070	0.035	0.022	0.012	0.007
DCP 2	-020	2.961	1.875	0.149	0.068	0.034	0.021	0.011	0.006
DCP 3	-030	2.827	1.717	0.147	0.067	0.033	0.020	0.010	0.005
DCP 4	-040	2.678	1.544	0.146	0.066	0.032	0.019	0.009	0.004
DCP 5	-074	2.517	1.375	0.145	0.065	0.031	0.018	0.008	0.003
DCP 6	-099	2.344	1.204	0.144	0.064	0.030	0.017	0.007	0.002
DCP 7	-149	1.844	0.944	0.143	0.063	0.029	0.016	0.006	0.001
DCP 8	-200	1.604	0.804	0.142	0.062	0.028	0.015	0.005	0.001
DCP 9	-250	1.404	0.704	0.141	0.061	0.027	0.014	0.004	0.001
DCP10	-300	1.204	0.604	0.140	0.060	0.026	0.013	0.003	0.001
DCP11	-350	0.904	0.504	0.139	0.059	0.025	0.012	0.002	0.001
DCP12	-401	0.704	0.404	0.138	0.058	0.024	0.011	0.001	0.001
DCP13	-400	0.504	0.304	0.137	0.057	0.023	0.010	0.001	0.001
DCP14	-701	0.304	0.204	0.136	0.056	0.022	0.009	0.001	0.001
DCP15	-800	0.104	0.104	0.135	0.055	0.021	0.008	0.001	0.001
DCP16	-800	-0.104	0.004	0.134	0.054	0.020	0.007	0.001	0.001
DCP17	-969	-0.104	0.004	0.133	0.053	0.019	0.006	0.001	0.001

REFRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WACH NO	DEL ALPHA	DEL M	ALPHA.O	TEST PRIMO	CYCLES ANALYSED	
0.0	51.57	0.191	0.400	5.61	0.0	7.47	12081.2	20	
V	Q	RN	CM(MINI)	CM(MAX)	ALPHA,MMAX	AERO DAMP	YMR	EXT DAMP	
(451.8)	137.7	0.65E 07	-0.035	1.217	12.08	-0.00005	1.072	0.0	
HARMONIC ANALYSIS									
DATA	RFS 0	RFS 1 PMI	RFS 2 PMI	RFS 3 PMI	RFS 4 PMI	RFS 5 PMI	RFS 6 PMI	RFS 7 PMI	RFS 8 PMI
TYPE	X/C								
ALPHA	7.447	5.608	0.330	0.110	0.070	0.034	0.024	0.017	0.019
CM	0.736	0.416	0.077	0.028	0.014	0.009	0.006	0.006	0.006
CM	-0.001	0.030	0.012	0.016	0.005	0.001	0.000	0.001	0.001
PCP 1	0.10	2.074	0.354	0.624	0.304	0.024	0.152	0.093	0.048
PCP 2	0.20	1.942	0.274	0.272	0.165	0.008	0.100	0.048	0.048
PCP 3	0.30	2.753	0.176	0.193	0.141	0.008	0.086	0.070	0.070
PCP 4	0.40	2.068	1.274	0.150	0.086	0.019	0.059	0.006	0.006
PCP 5	0.50	2.061	1.076	0.103	0.052	0.007	0.047	0.006	0.006
PCP 6	0.60	1.871	0.948	0.093	0.051	0.004	0.040	0.006	0.006
PCP 7	0.70	1.478	0.810	0.106	0.067	0.013	0.026	0.006	0.006
PCP 8	0.80	1.159	0.673	0.145	0.082	0.014	0.024	0.006	0.006
PCP 9	0.90	1.010	0.997	0.123	0.084	0.010	0.024	0.006	0.006
PCP 10	0.95	0.980	0.901	0.099	0.089	0.009	0.024	0.006	0.006
PCP 11	0.99	0.711	0.402	0.073	0.084	0.010	0.024	0.006	0.006
PCP 12	0.99	0.536	0.329	0.059	0.084	0.010	0.024	0.006	0.006
PCP 13	0.99	0.425	0.262	0.046	0.084	0.010	0.024	0.006	0.006
PCP 14	0.99	0.363	0.200	0.038	0.084	0.010	0.024	0.006	0.006
PCP 15	0.99	0.181	0.145	0.024	0.084	0.010	0.024	0.006	0.006
PCP 16	0.99	0.041	0.066	0.038	0.084	0.010	0.024	0.006	0.006
PCP 17	0.99	0.053	0.024	0.020	0.084	0.010	0.024	0.006	0.006

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	WACH NO	DEL ALPHA	DEL M	ALPHA.O	TEST PRIMO	CYCLES ANALYSED	
0.0	51.51	0.192	0.400	5.53	0.0	9.97	12081.3	20	
V	Q	RN	CM(MINI)	CM(MAX)	ALPHA,MMAX	AERO DAMP	YMR	EXT DAMP	
(447.4)	136.4	0.65E 07	-0.131	1.461	15.40	-0.00067	0.748	0.0	
HARMONIC ANALYSIS									
DATA	RFS 0	RFS 1 PMI	RFS 2 PMI	RFS 3 PMI	RFS 4 PMI	RFS 5 PMI	RFS 6 PMI	RFS 7 PMI	RFS 8 PMI
TYPE	X/C								
ALPHA	9.972	5.931	0.441	0.177	0.025	0.024	0.024	0.039	0.017
CM	0.868	0.465	0.114	0.020	0.026	0.017	0.004	0.012	0.005
CM	-0.017	0.044	0.014	0.019	0.014	0.009	0.002	0.004	0.004
PCP 1	0.10	1.786	1.1	0.487	0.130	0.193	0.106	0.033	0.054
PCP 2	0.20	1.174	0.747	0.236	0.131	0.168	0.140	0.094	0.049
PCP 3	0.30	2.804	0.797	0.425	0.159	0.104	0.111	0.088	0.042
PCP 4	0.40	2.647	0.862	0.174	0.024	0.062	0.037	0.010	0.037
PCP 5	0.50	2.777	0.862	0.174	0.024	0.062	0.037	0.010	0.037
PCP 6	0.60	2.050	0.808	0.131	0.034	0.084	0.043	0.009	0.023
PCP 7	0.70	1.502	0.770	0.098	0.034	0.084	0.043	0.009	0.023
PCP 8	0.80	1.119	0.711	0.282	0.048	0.051	0.020	0.021	0.021
PCP 9	0.90	1.164	0.671	0.257	0.048	0.051	0.020	0.021	0.021
PCP 10	0.95	1.048	0.623	0.215	0.048	0.051	0.020	0.021	0.021
PCP 11	0.99	0.892	0.569	0.177	0.048	0.051	0.020	0.021	0.021
PCP 12	0.99	0.674	0.462	0.146	0.048	0.051	0.020	0.021	0.021
PCP 13	0.99	0.534	0.381	0.113	0.048	0.051	0.020	0.021	0.021
PCP 14	0.99	0.440	0.290	0.128	0.048	0.051	0.020	0.021	0.021
PCP 15	0.99	0.263	0.221	0.127	0.048	0.051	0.020	0.021	0.021
PCP 16	0.99	0.014	0.137	0.088	0.048	0.051	0.020	0.021	0.021
PCP 17	0.99	-0.028	0.060	0.014	0.048	0.051	0.020	0.021	0.021

T-MED HZ 0.0
 V 135.4 (444.2)
 Q 48263. (1008.0)
 DRIVE HZ 51.64
 K 0.194
 RN 0.046 07
 MACH NO 0.403
 DEL-ALPHA 5.47
 DEL-M 0.0
 AIRFOIL NLR 1
 ALPHA.O 12.51
 ALPHA-MAX 17.38
 AERO DAMP -0.00074
 TEST POINT 12081.4
 TDR 0.822
 CYCLES ANALYSED 20
 EXT DAMP 0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA		12.519	5.467 0	0.417 31	0.336 350	0.049 126	0.044 122	0.039 34	0.033 214	0.030 268	0.009 220
CN		0.999	0.502 47	0.101 354	0.053 315	0.025 217	0.028 156	0.017 86	0.010 70	0.011 16	0.006 305
CM		-0.037	0.088 201	0.045 88	0.022 53	0.018 339	0.012 298	0.009 281	0.005 196	0.005 156	0.004 87
DCP 1	-010	4.017	0.446 125	1.180 93	0.220 94	0.191 71	0.068 174	0.031 145	0.043 180	0.007 131	0.039 201
DCP 2	-023	3.438	0.627 90	0.801 87	0.269 64	0.124 49	0.107 91	0.059 56	0.026 123	0.019 94	0.016 261
DCP 3	-030	3.048	0.869 110	0.866 81	0.276 59	0.129 48	0.108 51	0.052 8	0.030 92	0.037 35	0.003 348
DCP 4	-049	2.849	0.804 85	0.555 53	0.089 46	0.107 33	0.025 49	0.037 58	0.037 42	0.014 351	0.017 19
DCP 5	-074	2.466	0.808 77	0.432 40	0.105 49	0.130 7	0.036 316	0.003 305	0.032 40	0.010 335	0.014 10
DCP 6	-099	2.227	0.793 70	0.338 31	0.119 54	0.130 358	0.044 319	0.030 309	0.014 341	0.012 252	0.003 261
DCP 7	-149	1.792	0.774 51	0.257 19	0.141 13	0.109 313	0.026 276	0.015 297	0.023 311	0.012 194	0.009 317
DCP 8	-200	1.497	0.721 55	0.232 20	0.162 359	0.092 293	0.015 305	0.036 287	0.023 248	0.004 303	0.019 263
DCP 9	-250	1.327	0.729 48	0.219 3	0.195 337	0.123 264	0.056 232	0.027 234	0.051 207	0.036 178	0.025 124
DCP10	-300	1.185	0.660 44	0.172 357	0.180 331	0.115 258	0.075 216	0.043 179	0.041 142	0.029 124	0.031 96
DCP11	-399	1.028	0.647 44	0.141 341	0.148 331	0.108 256	0.086 182	0.060 131	0.054 100	0.031 49	0.032 5
DCP12	-501	0.812	0.585 40	0.135 315	0.119 299	0.092 220	0.089 154	0.066 94	0.056 69	0.046 16	0.043 312
DCP13	-600	0.667	0.533 38	0.154 292	0.107 264	0.094 185	0.084 113	0.062 56	0.049 14	0.044 318	0.043 274
DCP14	-701	0.570	0.445 35	0.182 272	0.106 224	0.104 150	0.070 82	0.058 20	0.036 328	0.032 280	0.021 218
DCP15	-800	0.367	0.370 24	0.183 261	0.113 203	0.097 126	0.068 62	0.025 18	0.027 310	0.027 285	0.030 286
DCP16	-900	0.084	0.240 8	0.098 256	0.075 197	0.063 108	0.048 62	0.025 18	0.013 270	0.001 112	0.005 3
DCP17	-969	-0.009	0.099 9	0.044 282	0.028 204	0.031 124	0.027 59	0.027 1			

T-MED HZ 0.0
 V 134.3 (440.8)
 Q 47665. (935.5)
 DRIVE HZ 51.73
 K 0.196
 RN 0.046 07
 MACH NO 0.400
 DEL-ALPHA 5.39
 DEL-M 0.0
 AIRFOIL NLR 1
 ALPHA.O 15.07
 ALPHA-MAX 18.61
 AERO DAMP -0.00107
 TEST POINT 12081.5
 TDR 1.197
 CYCLES ANALYSED 20
 EXT DAMP 0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI
ALPHA		15.071	5.376 0	0.284 27	0.312 22	0.078 188	0.073 196	0.029 73	0.025 287	0.022 9	0.016 198
CN		1.078	0.447 55	0.068 31	0.072 8	0.049 305	0.023 223	0.017 259	0.015 208	0.010 165	0.010 69
CM		-0.067	0.121 199	0.038 124	0.030 172	0.021 62	0.010 150	0.006 50	0.005 454	0.006 318	0.007 238
DCP 1	-010	1.754	1.478 159	0.760 127	0.208 180	0.095 176	0.074 249	0.014 247	0.017 29	0.014 330	0.025 259
DCP 2	-020	3.417	1.077 134	0.581 110	0.248 135	0.152 140	0.090 207	0.072 203	0.041 220	0.021 115	0.047 293
DCP 3	-030	3.048	1.103 137	0.563 108	0.297 129	0.161 94	0.092 188	0.087 140	0.047 173	0.036 151	0.018 212
DCP 4	-049	2.812	1.005 109	0.301 97	0.236 103	0.076 65	0.070 158	0.025 127	0.044 191	0.034 122	0.027 178
DCP 5	-074	2.530	0.955 95	0.187 77	0.114 88	0.048 72	0.041 111	0.033 114	0.027 161	0.024 126	0.023 108
DCP 6	-099	2.280	0.907 88	0.153 67	0.256 72	0.048 24	0.023 87	0.030 91	0.011 104	0.014 84	0.014 83
DCP 7	-145	1.870	0.866 69	0.148 61	0.248 51	0.078 16	0.030 12	0.036 19	0.011 294	0.011 183	0.019 187
DCP 8	-200	1.584	0.749 67	0.171 74	0.210 64	0.071 11	0.020 349	0.020 19	0.006 110	0.011 131	0.031 308
DCP 9	-250	1.400	0.752 61	0.180 63	0.243 53	0.146 354	0.070 287	0.026 154	0.046 149	0.042 123	0.027 293
DCP10	-300	1.261	0.688 55	0.165 60	0.215 29	0.153 350	0.070 287	0.048 135	0.032 113	0.035 109	0.031 272
DCP11	-399	1.119	0.681 49	0.114 45	0.176 27	0.166 347	0.084 289	0.060 198	0.043 288	0.042 227	0.035 172
DCP12	-501	0.977	0.681 44	0.098 0	0.171 157	0.146 320	0.081 250	0.072 270	0.043 288	0.042 227	0.035 172
DCP13	-600	0.781	0.651 37	0.124 326	0.127 316	0.129 284	0.040 226	0.077 241	0.043 204	0.042 182	0.047 123
DCP14	-701	0.678	0.578 32	0.153 311	0.144 274	0.144 234	0.091 173	0.047 155	0.043 156	0.042 137	0.038 73
DCP15	-800	0.484	0.497 23	0.167 304	0.167 261	0.143 208	0.076 164	0.046 166	0.034 174	0.034 91	0.045 24
DCP16	-900	0.150	0.309 12	0.118 297	0.083 234	0.083 189	0.056 106	0.003 111	0.019 176	0.014 9	0.044 10
DCP17	-969	0.020	0.141 15	0.062 101	0.047 231	0.041 182	0.033 97	0.075 120	0.007 243	0.003 134	0.010 96

REPRODUCIBILITY OF THE
 ORIGINAL PAGE IS

SPEED PITCHING OSCILLATION									
TUNER M2		K		WACH NO		DEL.M		ALPHA.0	
7.0		0.191		0.414		0.0		4.0R	
V		RN		CHIMIN)		ALPHAMAX		AEPH NAME	
139.9		0.66E 07		-0.03R		10.47		-0.00077	
(458.9)									
HARMONIC ANALYSIS									
X/C	REF 0	REF 1 PMI	REF 2 PMI	REF 3 PMI	REF 4 PMI	REF 5 PMI	REF 6 PMI	REF 7 PMI	REF 8 PMI
ALPHA	4.577	5.659	0	0.716	4	0.171 357	0.033 210	0.023 62	0.025 62
PM	0.941	0.400	1	0.024	17	0.003 314	0.001 314	0.001 179	0.002 87
	-0.001	0.020 301	0.790 250	0.003 320	0.002 235	0.001 97	0.001 240	0.001 176	0.001 200
REF 1	2.546	3.193 342	0.242 274	0.013 90	0.079 224	0.074 107	0.030 9	0.017 374	0.021 265
REF 2	2.012	2.137 349	0.134 10	0.067 2	0.011 21	0.036 317	0.055 217	0.036 125	0.014 131
REF 3	1.558	1.841 348	0.121 7	0.073 341	0.028 254	0.012 134	0.011 127	0.036 196	0.013 310
REF 4	0.949	1.560 349	0.094 3	0.058 344	0.022 254	0.004 139	0.002 123	0.005 180	0.002 17
REF 5	0.774	1.295 350	0.077 2	0.042 349	0.017 254	0.004 114	0.007 175	0.005 139	0.002 220
REF 6	0.765	1.472	0.073 7	0.033 10	0.015 263	0.009 122	0.004 172	0.004 76	0.004 262
REF 7	0.149	1.084	0.071 4	0.028 356	0.010 281	0.007 207	0.001 256	0.004 272	0.005 288
REF 8	0.882	0.626 0	0.042 23	0.022 11	0.012 303	0.003 230	0.001 248	0.004 341	0.003 341
REF 9	0.250	0.781	0.037 18	0.020 37	0.005 317	0.001 142	0.004 46	0.006 291	0.003 313
REF 10	0.677	0.433 0	0.020 10	0.011 34	0.003 312	0.004 276	0.004 113	0.004 113	0.002 107
REF 11	0.562	0.346 13	0.029 38	0.013 90	0.004 324	0.001 212	0.004 181	0.004 181	0.005 181
REF 12	0.345	0.267 19	0.024 48	0.011 91	0.004 70	0.002 320	0.004 44	0.004 44	0.005 141
REF 13	0.368	0.204 27	0.024 48	0.009 116	0.004 47	0.002 67	0.004 44	0.004 44	0.002 180
REF 14	0.195	0.113 38	0.032 47	0.011 90	0.004 30	0.004 244	0.007 347	0.004 0	0.005 16
REF 15	0.147	0.084 54	0.014 37	0.012 157	0.006 27	0.003 249	0.007 347	0.004 0	0.005 239
REF 16	0.036	0.049 91	0.009 245	0.003 126	0.006 64	0.003 345	0.009 81	0.003 313	0.005 42
REF 17	0.048	0.026 148	0.010 274	0.005 144	0.004 148	0.003 148	0.017 147	0.004 127	0.005 174

FORCED PITCHING OSCILLATION									
TUNER M2		K		WACH NO		DEL.M		ALPHA.0	
0.0		0.195		0.411		0.0		7.4R	
V		RN		CHIMIN)		ALPHAMAX		AEPH NAME	
138.2		0.65E 07		-0.036		12.91		-0.00097	
(453.4)									
HARMONIC ANALYSIS									
X/C	REF 0	REF 1 PMI	REF 2 PMI	REF 3 PMI	REF 4 PMI	REF 5 PMI	REF 6 PMI	REF 7 PMI	REF 8 PMI
ALPHA	7.475	5.618	0	0.377	3	0.051 271	0.036 75	0.019 54	0.005 180
PM	0.738	0.407	18	0.068 124	0.022 107	0.010 317	0.007 179	0.005 94	0.004 1
	-0.701	0.032 282	0.010 46	0.013 263	0.005 125	0.005 125	0.001 335	0.001 324	0.002 244
REF 1	3.296	3.053 332	0.631 19	0.040 310	0.185 211	0.054 314	0.137 184	0.055 69	0.034 260
REF 2	2.451	1.799	2	0.240 304	0.118 218	0.073 178	0.080 124	0.054 0	0.054 0
REF 3	2.746	1.687	0	0.324 358	0.112 188	0.069 120	0.056 60	0.054 132	0.056 253
REF 4	2.749	1.268	4	0.337 38	0.061 170	0.023 161	0.049 89	0.040 313	0.040 240
REF 5	2.744	1.064	6	0.241 351	0.064 314	0.015 0	0.025 53	0.049 307	0.025 195
REF 6	1.861	1.910	8	0.223 342	0.096 216	0.062 95	0.016 310	0.022 86	0.040 197
REF 7	1.450	2.247	4	0.160 310	0.070 167	0.071 40	0.018 232	0.025 270	0.010 158
REF 8	1.140	0.655	14	0.130 312	0.048 162	0.028 63	0.016 339	0.025 223	0.020 97
REF 9	0.716	0.576	12	0.109 291	0.077 121	0.050 46	0.011 186	0.014 191	0.021 52
REF 10	0.878	0.449	15	0.068 290	0.063 107	0.030 339	0.011 294	0.004 337	0.009 130
REF 11	0.715	0.397	26	0.062 291	0.060 96	0.014 297	0.013 211	0.004 147	0.007 147
REF 12	0.534	0.252	47	0.049 293	0.060 40	0.010 318	0.012 177	0.004 40	0.009 143
REF 13	0.425	0.252	47	0.031 311	0.039 74	0.023 294	0.009 124	0.008 193	0.008 145
REF 14	0.369	0.291	66	0.023 263	0.039 64	0.022 269	0.005 171	0.004 26	0.004 37
REF 15	0.187	0.144	68	0.003 263	0.003 263	0.007 249	0.005 175	0.007 332	0.004 109
REF 16	0.049	0.077	47	0.020 270	0.025 53	0.009 217	0.005 264	0.017 120	0.007 335
REF 17	-0.057	0.017	52	0.020 234	0.012 33	0.009 217	0.005 264	0.017 120	0.007 335

SPEED PITCHING OSCILLATION									
TUNER M7		K		WACH NO		DEL.M		ALPHA.0	
0.0		0.195		0.411		0.0		7.4R	
V		RN		CHIMIN)		ALPHAMAX		AEPH NAME	
138.2		0.65E 07		-0.036		12.91		-0.00097	
(453.4)									
HARMONIC ANALYSIS									
DATA	REF 0	REF 1	REF 2	REF 3	REF 4	REF 5	REF 6	REF 7	REF 8
TYPE	X/C	PMI	PMI	PMI	PMI	PMI	PMI	PMI	PMI
ALPHA									
PM									
REF 1	7.478	5.618 0	0.377 3	0.142 339	0.051 271	0.036 75	0.019 54	0.005 160	0.017 303
REF 2	0.718	0.407 18	0.068 124	0.022 107	0.010 312	0.007 179	0.005 94	0.004 1	0.002 50
REF 3	0.701	0.032 282	0.019 46	0.013 263	0.005 125	0.001 335	0.001 324	0.002 244	0.002 208
REF 4	2.296	2.053 352	0.631 39	0.507 119	1.185 211	0.034 314	0.137 184	0.096 69	0.014 260
REF 5	2.451	1.794 2	0.426 15	0.240 304	0.118 218	0.013 178	0.080 125	0.055 64	0.047 311
REF 6	2.746	1.687 0	0.324 354	0.172 284	0.112 188	0.009 120	0.054 60	0.044 312	0.031 207
REF 7	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 8	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 9	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 10	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 11	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 12	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 13	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 14	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 15	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 16	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207
REF 17	2.746	1.268 4	0.324 354	0.141 287	0.061 170	0.003 161	0.049 80	0.044 312	0.031 207

FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1			
TUNED HZ	DRIVE HZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	TEST POINT	CYCLES ANALYSED									
0.0	52.78	0.197	0.606	5.55	0.0	10.51	12083.3	20									
V	Q	RM	CHIMINI	CN(MAX)	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP									
136.7	48996	0.65E 07	-0.126	1.416	16.01	-0.00053	0.600	0.0									
(448.4)	(1023.3)																
HARMONIC ANALYSIS																	
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI						
ALPHA		10.908	5.548 0	0.373 17	0.245 313	0.030 111	0.016 73	0.034 39	0.028 167	0.001 21	0.012 104						
CM		0.870	0.454 38	0.094 329	0.012 203	0.025 97	0.013 329	0.007 20	0.011 242	0.008 177	0.003 72						
CM		-0.017	0.045 206	0.038 55	0.015 321	0.013 267	0.007 141	0.002 185	0.004 42	0.003 282	0.001 176						
DCP 1	-0.10	3.813	0.862 21	0.985 75	0.371 21	0.141 34	0.088 27	0.045 358	0.030 38	0.012 246	0.017 57						
DCP 2	-0.20	3.211	0.970 79	0.701 59	0.235 10	0.121 22	0.074 328	0.080 330	0.031 294	0.017 257	0.012 13						
DCP 3	-0.30	2.841	0.759 7	0.835 57	0.355 353	0.116 329	0.074 328	0.071 294	0.038 251	0.011 222	0.008 136						
DCP 4	-0.40	2.465	0.882 47	0.549 35	0.152 322	0.064 353	0.046 286	0.023 290	0.004 279	0.030 258	0.014 272						
DCP 5	-0.50	2.257	0.825 49	0.474 23	0.113 309	0.042 334	0.048 257	0.019 204	0.001 170	0.019 227	0.003 175						
DCP 6	-0.60	2.052	0.764 50	0.401 13	0.086 300	0.058 274	0.049 226	0.013 181	0.015 191	0.014 151	0.012 330						
DCP 7	-0.70	1.850	0.708 42	0.325 351	0.082 279	0.060 271	0.059 206	0.022 132	0.012 161	0.018 122	0.008 84						
DCP 8	-0.80	1.650	0.707 44	0.253 349	0.071 286	0.068 256	0.041 202	0.017 190	0.015 154	0.013 169	0.011 89						
DCP 9	-0.90	1.468	0.682 35	0.233 319	0.062 250	0.058 202	0.057 94	0.034 59	0.018 35	0.022 326	0.016 285						
DCP 10	-1.00	1.335	0.615 31	0.192 304	0.055 215	0.066 176	0.042 69	0.023 51	0.028 339	0.042 255	0.032 160						
DCP 11	-1.10	0.868	0.557 36	0.144 280	0.064 185	0.092 117	0.054 3	0.017 56	0.043 302	0.041 194	0.025 43						
DCP 12	-1.20	0.449	0.443 34	0.118 260	0.064 149	0.077 95	0.056 336	0.015 5	0.049 259	0.043 150	0.032 36						
DCP 13	-1.30	0.538	0.383 38	0.133 260	0.062 123	0.063 73	0.053 312	0.017 335	0.040 213	0.039 93	0.023 337						
DCP 14	-1.40	0.452	0.287 43	0.118 237	0.052 110	0.060 57	0.036 299	0.010 237	0.029 186	0.018 81	0.011 303						
DCP 15	-1.50	0.274	0.216 29	0.115 219	0.052 110	0.060 57	0.036 299	0.010 237	0.029 186	0.018 81	0.011 303						
DCP 16	-1.60	0.181	0.161 8	0.082 213	0.038 107	0.036 34	0.024 258	0.006 198	0.015 132	0.020 30	0.011 238						
DCP 17	-1.70	0.045	0.045 16	0.029 235	0.017 135	0.019 41	0.013 261	0.002 205	0.016 141	0.013 13	0.005 210						

FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1			
TUNED HZ	DRIVE HZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	TEST POINT	CYCLES ANALYSED									
0.0	52.78	0.197	0.605	5.36	0.0	12.53	12083.4	20									
V	Q	RM	CHIMINI	CN(MAX)	ALPHA-MAX	AERO DAMP	TDR	EXT DAMP									
136.1	48737	0.65E 07	-0.214	1.656	17.50	-0.00057	0.639	0.0									
(446.6)	(1017.9)																
HARMONIC ANALYSIS																	
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI						
ALPHA		12.525	5.359 0	0.379 32	0.303 325	0.058 119	0.022 71	0.030 10	0.037 149	0.012 215	0.019 163						
CM		0.992	0.495 86	0.092 353	0.049 299	0.027 184	0.015 106	0.008 70	0.010 27	0.008 310	0.004 201						
CM		-0.038	0.084 197	0.043 81	0.023 40	0.017 317	0.008 253	0.002 175	0.004 160	0.005 85	0.004 333						
DCP 1	-0.10	3.973	0.471 1.0	1.151 92	0.235 95	0.135 76	0.087 156	0.070 95	0.031 20	0.041 261	0.013 215						
DCP 2	-0.20	3.383	0.492 87	0.770 82	0.194 60	0.090 78	0.101 103	0.074 78	0.022 59	0.006 205	0.011 305						
DCP 3	-0.30	2.995	0.715 106	0.874 78	0.253 36	0.115 44	0.083 46	0.055 35	0.022 25	0.005 47	0.010 276						
DCP 4	-0.40	2.825	0.818 82	0.562 53	0.112 31	0.103 11	0.067 349	0.029 29	0.016 330	0.011 311	0.028 226						
DCP 5	-0.50	2.446	0.822 74	0.421 39	0.113 39	0.123 352	0.021 296	0.025 348	0.012 280	0.015 139	0.016 108						
DCP 6	-0.60	2.193	0.804 70	0.341 33	0.126 33	0.104 339	0.019 302	0.025 44	0.023 23	0.006 295	0.009 87						
DCP 7	-0.70	1.766	0.809 55	0.253 9	0.145 5	0.123 301	0.051 254	0.029 214	0.005 185	0.010 101	0.016 316						
DCP 8	-0.80	1.482	0.761 55	0.234 14	0.158 358	0.106 295	0.033 238	0.015 231	0.006 72	0.013 336	0.016 245						
DCP 9	-0.90	1.324	0.699 48	0.203 4	0.177 325	0.114 239	0.041 194	0.021 159	0.004 169	0.028 118	0.014 53						
DCP 10	-1.00	1.190	0.638 43	0.175 359	0.170 314	0.103 235	0.040 192	0.030 158	0.032 144	0.038 94	0.024 22						
DCP 11	-1.10	0.814	0.600 43	0.130 342	0.138 308	0.097 218	0.054 174	0.035 117	0.031 108	0.046 42	0.026 325						
DCP 12	-1.20	0.570	0.523 35	0.129 308	0.116 282	0.105 195	0.067 134	0.035 80	0.044 28	0.051 345	0.033 256						
DCP 13	-1.30	0.470	0.433 32	0.154 285	0.098 251	0.100 168	0.067 108	0.037 54	0.049 28	0.055 310	0.031 220						
DCP 14	-1.40	0.374	0.348 19	0.170 245	0.105 216	0.096 126	0.057 47	0.026 346	0.034 331	0.041 250	0.027 167						
DCP 15	-1.50	0.278	0.229 8	0.171 253	0.071 180	0.102 104	0.054 352	0.032 316	0.034 293	0.038 223	0.029 124						
DCP 16	-1.60	0.078	0.078 19	0.090 244	0.071 180	0.054 76	0.040 351	0.012 255	0.017 285	0.024 206	0.025 85						
DCP 17	-1.70	0.017	0.092 7	0.038 267	0.032 183	0.026 83	0.017 16	0.006 205	0.013 312	0.011 248	0.012 167						

FORCED PITCHING OSCILLATION									
AIRFOIL MLP 1									
TUNER MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
Q	Q	BN	CM(MIN)	CM(MAX)	ALPHA-MIN	ALPHA-MAX	TOP	FXT RAMP	FXT RAMP
134.9	48038.	0.64E 07	-0.264	1.862	18.42	-0.00101	1.123	0.0	0.0
(442.6)	(1003.3)								
HARMONIC ANALYSIS									
DATA	REF 1	REF 2	REF 3	REF 4	REF 5	REF 6	REF 7	REF 8	REF 9
TYPE	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
ALPHA	15.005	5.376	0	0.335	0.334	0.031	0.043	0.016	0.027
CM	1.041	0.443	45	0.073	0.072	0.017	0.004	0.009	0.023
CM	-0.041	0.119	104	0.034	0.030	0.006	0.003	0.005	0.005
REF 1	1.475	1.600	0.721	0.199	0.118	0.024	0.027	0.034	0.020
REF 2	3.448	1.037	132	0.599	0.177	0.066	0.055	0.060	0.076
REF 3	2.943	1.154	138	0.561	0.177	0.066	0.055	0.060	0.076
REF 4	2.889	1.002	108	0.280	0.105	0.045	0.046	0.046	0.046
REF 5	2.517	0.950	95	0.204	0.077	0.035	0.035	0.035	0.035
REF 6	2.266	0.904	87	0.182	0.077	0.035	0.035	0.035	0.035
REF 7	1.651	0.834	71	0.146	0.077	0.035	0.035	0.035	0.035
REF 8	1.542	0.746	67	0.103	0.077	0.035	0.035	0.035	0.035
REF 9	1.422	0.746	58	0.103	0.077	0.035	0.035	0.035	0.035
REF 10	1.284	0.699	51	0.119	0.077	0.035	0.035	0.035	0.035
REF 11	1.124	0.669	43	0.091	0.077	0.035	0.035	0.035	0.035
REF 12	0.922	0.661	37	0.106	0.077	0.035	0.035	0.035	0.035
REF 13	0.779	0.640	32	0.142	0.077	0.035	0.035	0.035	0.035
REF 14	0.677	0.496	22	0.153	0.077	0.035	0.035	0.035	0.035
REF 15	0.469	0.498	12	0.099	0.077	0.035	0.035	0.035	0.035
REF 16	0.152	0.740	73	0.005	0.077	0.035	0.035	0.035	0.035
REF 17	0.724	0.142	12	0.065	0.077	0.035	0.035	0.035	0.035

FORCED PITCHING OSCILLATION									
AIRFOIL MLP 1									
TUNER MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
Q	Q	BN	CM(MIN)	CM(MAX)	ALPHA-MIN	ALPHA-MAX	TOP	FXT RAMP	FXT RAMP
141.8	51921.	0.86E 07	-0.038	0.951	10.50	-0.00076	0.992	0.0	0.0
(465.1)	(1084.4)								
HARMONIC ANALYSIS									
DATA	REF 1	REF 2	REF 3	REF 4	REF 5	REF 6	REF 7	REF 8	REF 9
TYPE	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
ALPHA	4.950	5.678	0	0.173	0.024	0.012	0.029	0.017	0.013
CM	0.569	0.397	1	0.027	0.001	0.002	0.002	0.003	0.001
CM	-0.037	0.024	298	0.003	0.000	0.001	0.001	0.001	0.000
REF 1	3.059	3.447	0.250	0.034	0.068	0.014	0.007	0.017	0.009
REF 2	1.964	2.105	349	0.120	0.045	0.014	0.007	0.014	0.006
REF 3	1.612	1.831	344	0.110	0.045	0.014	0.007	0.014	0.006
REF 4	1.793	1.531	349	0.091	0.045	0.014	0.007	0.014	0.006
REF 5	1.570	1.214	350	0.073	0.045	0.014	0.007	0.014	0.006
REF 6	1.435	1.010	352	0.068	0.045	0.014	0.007	0.014	0.006
REF 7	1.060	0.759	353	0.043	0.045	0.014	0.007	0.014	0.006
REF 8	0.861	0.514	359	0.034	0.045	0.014	0.007	0.014	0.006
REF 9	0.759	0.514	359	0.034	0.045	0.014	0.007	0.014	0.006
REF 10	0.548	0.447	2	0.028	0.045	0.014	0.007	0.014	0.006
REF 11	0.425	0.347	13	0.028	0.045	0.014	0.007	0.014	0.006
REF 12	0.363	0.290	28	0.023	0.045	0.014	0.007	0.014	0.006
REF 13	0.346	0.142	34	0.016	0.045	0.014	0.007	0.014	0.006
REF 14	0.174	0.093	53	0.015	0.045	0.014	0.007	0.014	0.006
REF 15	0.044	0.040	73	0.005	0.045	0.014	0.007	0.014	0.006
REF 16	-0.044	0.040	73	0.005	0.045	0.014	0.007	0.014	0.006
REF 17	-0.061	0.019	145	0.006	0.045	0.014	0.007	0.014	0.006

FORCED PITCHING OSCILLATION									
TUNED HZ		DRIVE HZ		K		MACH NO		DEL ALPHA	
0.0		53.95		0.199		0.411		5.57	
V		Q		RN		CN(MIN)		CN(MAX)	
139.8		50988.		0.65E 07		-0.03%		1.172	
(458.6)		(1064.9)						13.11	
HARMONIC ANALYSIS									
X/C		RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		7.474	5.671	0	0.132	0.028	0.031	0.028	0.015
CM		0.718	0.405	19	0.046	0.028	0.004	0.002	0.004
CM		-0.002	0.032	279	0.009	0.004	0.001	0.001	0.001
DCP 1	0.13	2.700	1.947	353	0.564	0.216	0.017	0.110	0.043
DCP 2	0.20	2.774	1.765	2	0.223	0.110	0.034	0.080	0.046
DCP 3	0.20	2.684	1.660	0	0.170	0.083	0.025	0.044	0.035
DCP 4	0.24	2.524	1.754	4	0.144	0.055	0.015	0.043	0.035
DCP 5	0.24	2.025	1.066	6	0.108	0.035	0.009	0.021	0.021
DCP 6	0.49	1.833	0.439	8	0.076	0.021	0.005	0.014	0.014
DCP 7	0.49	1.391	0.784	8	0.214	0.050	0.012	0.017	0.017
DCP 8	0.70	1.133	0.665	14	0.160	0.039	0.005	0.017	0.017
DCP 9	0.70	0.997	0.571	13	0.077	0.028	0.004	0.017	0.017
DCP 10	0.70	0.856	0.498	28	0.059	0.028	0.004	0.017	0.017
DCP 11	0.70	0.824	0.424	34	0.045	0.024	0.004	0.017	0.017
DCP 12	0.70	0.816	0.262	47	0.039	0.024	0.004	0.017	0.017
DCP 13	0.70	0.814	0.149	66	0.032	0.021	0.004	0.017	0.017
DCP 14	0.70	0.814	0.070	49	0.027	0.024	0.004	0.017	0.017
DCP 15	0.70	0.814	0.025	53	0.016	0.023	0.004	0.017	0.017
DCP 16	0.70	0.814	0.007	53	0.016	0.023	0.004	0.017	0.017
DCP 17	0.70	0.814	0.007	53	0.016	0.023	0.004	0.017	0.017

FORCED PITCHING OSCILLATION									
TUNED HZ		DRIVE HZ		K		MACH NO		DEL ALPHA	
0.0		53.94		0.199		0.411		5.57	
V		Q		RN		CN(MIN)		CN(MAX)	
138.3		50068.		0.65E 07		-0.133		1.418	
(453.7)		(1745.7)							
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		10.127	5.573	0	0.325	0.025	0.034	0.021	0.031
CM		0.845	0.459	30	0.019	0.027	0.009	0.011	0.008
CM		-0.019	0.345	209	0.038	0.012	0.007	0.004	0.005
DCP 1		3.173	0.034	16	0.308	0.139	0.093	0.070	0.017
DCP 2		3.090	0.027	32	0.243	0.181	0.097	0.073	0.011
DCP 3		2.761	0.007	46	0.177	0.096	0.052	0.067	0.007
DCP 4		2.523	0.007	53	0.183	0.054	0.046	0.020	0.010
DCP 5		0.74	0.007	42	0.151	0.027	0.043	0.003	0.011
DCP 6		0.74	0.007	45	0.116	0.021	0.043	0.003	0.011
DCP 7		1.566	0.007	39	0.101	0.021	0.043	0.003	0.011
DCP 8		1.295	0.007	41	0.070	0.021	0.043	0.003	0.011
DCP 9		1.148	0.007	34	0.066	0.021	0.043	0.003	0.011
DCP 10		1.015	0.007	32	0.066	0.021	0.043	0.003	0.011
DCP 11		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 12		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 13		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 14		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 15		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 16		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011
DCP 17		0.854	0.007	35	0.066	0.021	0.043	0.003	0.011

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR.

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA.O	TEST POINT	CYCLES ANALYSED	
0.0	53.93	0.200	0.409	5.47	0.0	12.28	12085.4	20	
V	Q	RN	CHIMIN	CHIMAX	ALPHA.NMAX	AERO DAMP	TDR	EXT DAMP	
(450.8)	49561.1	0.65E 07	-0.227	1.688	17.68	-0.00042	0.477	0.0	
HARMONIC ANALYSIS									
X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	12.278	5.470 0	0.454 26	0.381 323	0.042 108	0.050 96	0.037 355	0.047 133	0.025 195
CN	0.979	0.497 43	0.091 358	0.071 294	0.040 188	0.020 124	0.013 60	0.010 29	0.007 289
CM	-0.041	0.086 196	0.047 77	0.028 36	0.021 312	0.007 252	0.006 241	0.007 171	0.005 94
DCP 1	0.10	3.442	0.392 117	1.229 87	0.274 77	0.112 53	0.090 46	0.042 215	0.083 136
DCP 2	0.20	3.256	0.667 90	0.890 81	0.104 43	0.140 90	0.125 41	0.031 49	0.082 127
DCP 3	0.30	3.013	0.658 93	0.898 75	0.096 27	0.121 50	0.113 7	0.040 0	0.024 26
DCP 4	0.40	2.810	0.791 73	0.567 54	0.132 25	0.101 8	0.066 343	0.010 47	0.014 30
DCP 5	0.74	2.426	0.774 67	0.427 41	0.122 14	0.091 340	0.058 321	0.004 310	0.016 312
DCP 6	0.89	2.178	0.768 63	0.342 35	0.150 17	0.108 317	0.061 310	0.020 245	0.015 271
DCP 7	1.49	1.738	0.776 52	0.291 16	0.172 368	0.118 283	0.041 258	0.023 232	0.019 194
DCP 8	2.00	1.446	0.711 54	0.252 23	0.186 327	0.096 260	0.030 273	0.037 273	0.029 201
DCP 9	2.50	1.306	0.701 47	0.229 10	0.236 321	0.146 245	0.025 153	0.046 183	0.033 130
DCP10	3.00	1.159	0.636 43	0.184 3	0.211 311	0.140 229	0.032 144	0.055 142	0.028 80
DCP11	3.99	1.002	0.618 42	0.129 350	0.185 312	0.110 229	0.043 183	0.059 131	0.023 53
DCP12	5.01	0.813	0.572 36	0.121 313	0.149 283	0.111 196	0.058 182	0.051 77	0.040 349
DCP13	6.00	0.675	0.534 32	0.153 282	0.136 249	0.117 160	0.066 87	0.075 35	0.065 315
DCP14	7.01	0.573	0.454 29	0.190 261	0.133 214	0.122 128	0.065 74	0.059 344	0.051 285
DCP15	8.00	0.369	0.375 19	0.188 252	0.150 191	0.130 102	0.041 342	0.042 308	0.032 212
DCP16	9.00	0.092	0.240 3	0.116 239	0.094 171	0.067 76	0.031 6	0.034 301	0.024 209
DCP17	9.69	-0.006	0.102 2	0.050 253	0.042 176	0.038 77	0.006 338	0.018 265	0.003 80

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA.O	TEST POINT	CYCLES ANALYSED	
0.0	53.73	0.201	0.406	5.44	0.0	15.08	12085.5	20	
V	Q	RN	CHIMIN	CHIMAX	ALPHA.NMAX	AERO DAMP	TDR	EXT DAMP	
(446.6)	48809.1	0.65E 07	-0.262	1.893	19.03	-0.00081	0.906	0.0	
HARMONIC ANALYSIS									
X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	15.082	5.439 0	0.303 36	0.328 15	0.093 172	0.029 199	0.045 69	0.053 246	0.009 334
CN	1.063	0.526 55	0.074 37	0.081 358	0.047 283	0.019 199	0.010 211	0.016 201	0.011 118
CM	-0.049	0.115 197	0.034 124	0.031 97	0.022 50	0.007 317	0.005 22	0.006 331	0.007 348
DCP 1	0.10	3.629	1.487 156	0.490 117	0.248 167	0.107 265	0.074 336	0.031 321	0.051 276
DCP 2	0.20	3.385	1.025 132	0.502 106	0.223 152	0.099 186	0.060 168	0.040 279	0.044 294
DCP 3	0.30	2.487	1.135 136	0.562 105	0.342 126	0.144 87	0.108 127	0.048 191	0.044 174
DCP 4	0.40	2.865	0.985 105	0.250 84	0.251 103	0.069 44	0.050 128	0.095 184	0.022 270
DCP 5	0.74	2.404	0.936 94	0.209 77	0.260 79	0.060 79	0.048 81	0.014 107	0.014 113
DCP 6	0.89	2.240	0.874 88	0.184 87	0.288 69	0.070 344	0.045 104	0.009 87	0.016 171
DCP 7	1.49	1.826	0.807 71	0.182 70	0.281 41	0.084 330	0.029 352	0.042 57	0.026 248
DCP 8	2.00	1.566	0.767 68	0.203 71	0.251 35	0.105 346	0.032 324	0.043 11	0.016 259
DCP 9	2.50	1.403	0.739 59	0.209 60	0.259 12	0.134 319	0.057 291	0.021 337	0.014 253
DCP10	3.00	1.267	0.673 53	0.182 57	0.271 5	0.166 319	0.049 275	0.031 337	0.014 199
DCP11	3.99	1.117	0.684 49	0.127 45	0.194 0	0.165 297	0.065 272	0.052 233	0.021 215
DCP12	5.01	0.915	0.647 41	0.101 9	0.154 342	0.155 297	0.067 232	0.055 191	0.021 185
DCP13	6.00	0.773	0.631 36	0.119 330	0.147 311	0.144 266	0.053 213	0.053 180	0.049 132
DCP14	7.01	0.455	0.547 30	0.134 305	0.160 274	0.139 229	0.072 149	0.036 117	0.054 94
DCP15	8.00	0.452	0.457 20	0.151 297	0.159 249	0.124 200	0.069 118	0.017 97	0.037 64
DCP16	9.00	0.144	0.289 8	0.094 200	0.124 200	0.078 175	0.042 82	0.014 105	0.041 23
DCP17	9.69	0.021	0.141 14	0.062 297	0.051 234	0.049 166	0.017 71	0.008 195	0.010 48

FORCED PITCHING OSCILLATION									
AIRFOIL									
NLR 1									
DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI
ALPHA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA
CM	CM	CM	CM	CM	CM	CM	CM	CM	CM
DCP 1	-0.10	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 2	-0.20	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 3	-0.30	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 4	-0.40	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 5	-0.50	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 6	-0.60	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 7	-0.70	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 8	-0.80	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 9	-0.90	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 10	-1.00	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 11	-1.10	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 12	-1.20	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 13	-1.30	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 14	-1.40	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 15	-1.50	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 16	-1.60	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 17	-1.70	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
AIRFOIL									
NLR 1									
DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI
ALPHA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA	DELTA
CM	CM	CM	CM	CM	CM	CM	CM	CM	CM
DCP 1	-0.10	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 2	-0.20	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 3	-0.30	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 4	-0.40	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 5	-0.50	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 6	-0.60	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 7	-0.70	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 8	-0.80	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 9	-0.90	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 10	-1.00	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 11	-1.10	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 12	-1.20	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 13	-1.30	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 14	-1.40	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 15	-1.50	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 16	-1.60	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098
DCP 17	-1.70	2.098	2.098	2.098	2.098	2.098	2.098	2.098	2.098

FORCED PITCHING OSCILLATION										AIRFOIL NLR 1										CYCLES ANALYSED									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST PLANE	EXT DAMP		DEL-ALPHA	DEL-M	ALPHA-0	TEST PLANE	EXT DAMP															
0.0	69.56	0.262	0.402	5.78	0.0	9.92	12031.5	0.0		5.78	0.0	9.92	12031.5	0.0															
V	Q	RN	CHIMINI	CHIMAXI	ALPHA-MAX	AERO DAMP	FDR			CHIMINI	CHIMAXI	AERO DAMP	FDR																
135.3	47837.	0.646 07	-0.156	1.515	15.91	-0.00026	0.314			1.515	15.91	-0.00026	0.314																
(443.9)	(999.1)																												
HARMONIC ANALYSIS										HARMONIC ANALYSIS										HARMONIC ANALYSIS									
X/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16	RES 17	RES 18	RES 19	RES 20	RES 21	RES 22	RES 23	RES 24	RES 25	RES 26	RES 27	RES 28
ALPHA	9.918	5.780	0.775	0.117	0.035	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CN	0.897	0.538	0.109	0.045	0.015	0.005	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
CM	-0.019	0.048	0.047	0.029	0.015	0.006	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 1	0.010	1.268	1.043	0.434	0.071	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 2	0.020	1.123	0.883	0.379	0.063	0.010	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 3	0.030	1.014	0.807	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 4	0.040	0.907	0.733	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 5	0.050	0.807	0.662	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 6	0.060	0.710	0.587	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 7	0.070	0.613	0.511	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 8	0.080	0.518	0.418	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 9	0.090	0.423	0.323	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 10	0.100	0.328	0.228	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 11	0.110	0.233	0.133	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 12	0.120	0.138	0.038	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 13	0.130	0.043	0.043	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 14	0.140	0.048	0.048	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 15	0.150	0.053	0.053	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 16	0.160	0.058	0.058	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
DCP 17	0.170	0.063	0.063	0.356	0.074	0.012	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible][illegible]

[illegible]

DATA TYPE		FORCED BENDING OSCILLATION				AIRFOIL				MIP 1				CYCLES ANALYSED			
		DRIVE M2 0.0	K 0.138	WASH W0 0.393		CEL ALPHA 6.66	DEL M 0.0			TEST POINT 12009.3		ALPHA 0 6.65					
		Q 17053.1 (357.0)	RM 0.235 07	CHINITI -0.069		CHINITI 1.110	ALPHA MAX 12.55	DEL DAMP -0.00003		YR 1.793		DEL DAMP 0.0					
HARMONIC ANALYSIS																	
X/C	REF 0	REF 1 PMI	REF 2 PMI	REF 3 PMI	REF 4 PMI	REF 5 PMI	REF 6 PMI	REF 7 PMI	REF 8 PMI	REF 9 PMI	REF 10 PMI	REF 11 PMI	REF 12 PMI	REF 13 PMI	REF 14 PMI		
0.048	0.711	0.667 0	1.207 305	0.073 215	0.076 98	0.059 357	0.017 63	0.049 1	0.013 231	0.006 162							
0.051	0.685 17	0.685 17	0.372 335	0.003 62	0.006 282	0.010 931	0.001 191	0.001 968	0.002 155	0.002 273							
-0.061	0.709 294	0.721 214	0.003 210	0.000 72	0.002 152			0.001 136	0.002 342	0.000 149							
0.064	0.759 161	0.734 245	0.036 222	0.065 118	0.063 76	0.067 76	0.067 72	0.074 186	0.020 116	0.021 269							
0.070	0.791 343	0.734 245	0.036 181	0.051 134	0.0 152	0.069 61	0.069 61	0.043 197	0.041 183	0.051 32							
0.075	0.755 351	0.722 279	0.129 149	0.166 51	0.11 309	0.105 213	0.105 213	0.077 142	0.076 44	0.087 342							
0.080	0.766 354	0.723 279	0.020 230	0.022 77	0.047 312	0.058 213	0.058 213	0.047 107	0.046 351	0.050 243							
0.084	0.712 356	0.675 287	0.020 244	0.023 120	0.023 104	0.026 184	0.026 184	0.033 104	0.032 312	0.033 196							
0.088	0.637 356	0.614 298	0.018 248	0.019 85	0.010 265	0.010 265	0.010 265	0.018 129	0.013 106	0.011 308							
0.092	0.654 357	0.637 3	0.015 39	0.008 150	0.014 313	0.019 93	0.019 93	0.004 139	0.012 136	0.011 308							
0.096	0.718 15	0.670 17	0.010 351	0.008 339	0.001 215	0.001 215	0.001 215	0.013 294	0.008 8	0.012 135							
0.100	0.704 16	0.670 17	0.007 340	0.028 336	0.017 231	0.001 231	0.001 231	0.011 282	0.010 87	0.012 135							
0.104	0.734 16	0.704 329	0.007 277	0.027 336	0.010 393	0.001 393	0.001 393	0.011 282	0.010 87	0.012 135							
0.108	0.674 37	0.640 37	0.006 13	0.030 289	0.003 154	0.001 154	0.001 154	0.011 282	0.010 87	0.012 135							
0.112	0.651 377 46	0.606 13	0.006 13	0.030 289	0.003 154	0.001 154	0.001 154	0.011 282	0.010 87	0.012 135							
0.116	0.633 377 47	0.599 13	0.006 13	0.030 289	0.003 154	0.001 154	0.001 154	0.011 282	0.010 87	0.012 135							
0.120	0.614 377 48	0.584 13	0.006 13	0.030 289	0.003 154	0.001 154	0.001 154	0.011 282	0.010 87	0.012 135							
0.124	0.595 377 49	0.569 13	0.006 13	0.030 289	0.003 154	0.001 154	0.001 154	0.011 282	0.010 87	0.012 135							
0.128	0.576 377 50	0.554 13	0.006 13	0.													

FORCED PITCHING OSCILLATION																				
TUNED MZ		DRIVE MZ		K		MACH NO		AIRFOIL												
0.0		23.01		0.070		0.500		DEL-ALPHA												
								DEL-N												
								ALPHA-0												
								17.33												
								AERO DAMP												
								-0.00212												
								EXT DAMP												
								0.0												
HARMONIC ANALYSIS																				
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI									
ALPHA		17.335	0	0.210	5	0.025	267	0.010	105	0.022	34	0.021	51	0.015	252	0.036	152	0.008	55	
CM		0.972	88	0.006	104	0.011	241	0.009	307	0.004	291	0.005	228	0.008	293	0.003	221	0.001	49	
CM		-0.066	0.052	209	0.012	260	0.004	44	0.001	91	0.001	52	0.001	348	0.001	87	0.003	318	0.001	139
DCP 1	-0.10	3.147	0.595	179	0.220	340	0.134	352	0.057	339	0.036	252	0.041	179	0.054	261	0.018	280	0.034	131
DCP 2	-0.20	2.939	0.450	175	0.195	327	0.116	8	0.036	26	0.017	306	0.028	167	0.055	251	0.027	294	0.020	139
DCP 3	-0.30	2.794	0.421	169	0.186	325	0.034	350	0.047	21	0.014	303	0.035	350	0.026	311	0.027	320	0.018	167
DCP 4	-0.40	2.184	0.483	158	0.134	266	0.033	40	0.002	355	0.031	24	0.017	298	0.026	336	0.039	306	0.013	126
DCP 5	-0.74	1.998	0.448	153	0.104	248	0.001	203	0.009	309	0.026	6	0.021	269	0.019	293	0.031	315	0.009	49
DCP 6	-0.99	1.868	0.375	143	0.089	235	0.022	223	0.009	269	0.014	302	0.024	234	0.011	298	0.020	308	0.002	41
DCP 7	-1.49	1.626	0.272	126	0.056	220	0.016	195	0.010	197	0.010	243	0.001	170	0.018	281	0.023	297	0.005	305
DCP 8	-2.00	1.449	0.208	119	0.055	235	0.017	124	0.019	315	0.014	272	0.006	319	0.011	301	0.023	297	0.005	305
DCP 9	-2.50	1.355	0.231	112	0.041	209	0.024	211	0.018	324	0.013	105	0.014	209	0.009	241	0.023	297	0.005	305
DCP 10	-3.00	1.223	0.211	97	0.028	171	0.024	220	0.012	257	0.013	19	0.010	169	0.009	241	0.023	297	0.005	305
DCP 11	-3.99	1.070	0.217	79	0.031	130	0.024	220	0.019	292	0.013	109	0.010	169	0.009	241	0.023	297	0.005	305
DCP 12	-5.01	0.871	0.213	58	0.036	98	0.020	249	0.020	321	0.007	332	0.010	248	0.004	273	0.012	310	0.004	93
DCP 13	-6.00	0.719	0.227	44	0.045	91	0.015	236	0.010	295	0.008	281	0.004	249	0.011	317	0.009	325	0.002	393
DCP 14	-7.01	0.603	0.216	34	0.047	71	0.013	231	0.004	272	0.004	222	0.008	175	0.007	269	0.009	325	0.002	24
DCP 15	-8.00	0.451	0.195	30	0.045	66	0.015	225	0.001	170	0.012	235	0.004	176	0.011	248	0.006	325	0.002	347
DCP 16	-9.00	0.324	0.138	34	0.040	55	0.006	234	0.008	183	0.009	226	0.004	166	0.003	240	0.008	325	0.003	314
DCP 17	-9.69	0.024	0.095	46	0.013	51	0.009	240	0.003	39	0.002	251	0.004	97	0.001	315	0.011	356	0.003	357

FORCED PITCHING OSCILLATION									
TUNED MZ		DRIVE MZ		K		MACH NO		AIRFOIL	
0.0		22.80		0.070		0.499		DEL-ALPHA	
								DEL-N	
								ALPHA-0	
								19.80	
								AERO DAMP	
								-0.00234	
								EXT DAMP	
								0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA									
CM									
CM									
DCP 1	-0.10	2.711	0.701 167	0.126 63	0.025 110	0.056 295	0.049 12	0.032 217	0.031 190
DCP 2	-0.20	2.509	0.586 168	0.107 75	0.038 195	0.009 323	0.052 37	0.035 204	0.014 227
DCP 3	-0.30	2.384	0.693 162	0.169 271	0.047 121	0.039 290	0.022 75	0.027 211	0.015 263
DCP 4	-0.40	2.129	0.174 125	0.098 233	0.025 211	0.015 7	0.045 144	0.023 138	0.017 237
DCP 5	-0.74	1.971	0.188 122	0.099 231	0.019 254	0.024 297	0.014 149	0.018 174	0.024 180
DCP 6	-0.99	1.874	0.165 104	0.091 224	0.021 154	0.025 265	0.011 258	0.010 181	0.014 183
DCP 7	-1.49	1.628	0.145 98	0.057 199	0.024 258	0.016 218	0.015 326	0.009 271	0.014 185
DCP 8	-2.00	1.427	0.166 31	0.038 208	0.023 255	0.004 28	0.021 316	0.004 171	0.007 16
DCP 9	-2.50	1.347	0.186 95	0.040 210	0.015 237	0.012 150	0.017 261	0.004 147	0.012 334
DCP 10	-3.00	1.232	0.198 75	0.026 198	0.012 167	0.012 150	0.017 289	0.005 193	0.009 259
DCP 11	-3.99	1.104	0.192 63	0.021 52	0.015 121	0.008 94	0.011 287	0.012 0	0.003 355
DCP 12	-5.01	0.927	0.192 43	0.021 52	0.015 105	0.008 85	0.012 257	0.011 9	0.008 192
DCP 13	-6.00	0.789	0.191 55	0.026 48	0.008 119	0.007 60	0.009 240	0.010 306	0.007 356
DCP 14	-7.01	0.673	0.149 46	0.041 37	0.009 177	0.008 342	0.008 219	0.010 306	0.009 217
DCP 15	-8.00	0.517	0.177 44	0.045 50	0.008 149	0.008 342	0.008 219	0.010 306	0.011 282
DCP 16	-9.00	0.413	0.177 33	0.029 28	0.006 115	0.007 352	0.008 176	0.009 293	0.010 294
DCP 17	-9.69	0.304	0.074 67	0.010 2	0.002 121	0.002 338	0.004 224	0.002 335	0.001 82

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				TEST POINT				CYCLES ANALYSED	
		TUNED HZ 0.0	DRIVE HZ 23.07	K 0.069	MACH NO 0.506	DEL ALPHA 4.91	DEL H 0.0	ALPHA.0 14.97	ALPHA.0 14.97	TEST POINT 12043.3	RES 7 PHI	RES 8 PHI	RES 9 PHI	20	EXT DAMP 0.0
HARMONIC ANALYSIS															
ALPHA		RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	RES 10 PHI	RES 11 PHI	RES 12 PHI	RES 13 PHI
CM		14.970	4.911	0	0.023 254	0.025 256	0.038 3	0.040 34	0.046 187	0.014 151	0.005 37	0.001 71	0.001 77	0.001 77	0.001 77
CM		0.079	0.173 102	0.050 214	0.031 267	0.007 194	0.010 224	0.001 294	0.003 178	0.001 251	0.001 251	0.001 251	0.001 251	0.001 251	0.001 251
DCP 1	-010	3.732	1.236 168	0.179 274	0.139 76	0.098 241	0.009 282	0.032 213	0.016 2	0.024 332	0.015 149	0.008 145	0.008 145	0.008 145	0.008 145
DCP 2	-020	3.492	1.316 173	0.345 270	0.091 68	0.145 264	0.029 335	0.027 171	0.023 263	0.008 146	0.008 146	0.008 146	0.008 146	0.008 146	0.008 146
DCP 3	-030	3.298	1.335 175	0.320 263	0.062 335	0.144 267	0.109 349	0.026 114	0.015 38	0.031 146	0.031 146	0.031 146	0.031 146	0.031 146	0.031 146
DCP 4	-040	2.794	1.112 169	0.603 263	0.198 356	0.025 200	0.060 322	0.056 97	0.059 191	0.028 249	0.028 249	0.028 249	0.028 249	0.028 249	0.028 249
DCP 5	-074	2.353	0.723 157	0.317 241	0.114 320	0.023 259	0.036 279	0.015 340	0.011 149	0.029 187	0.029 187	0.029 187	0.029 187	0.029 187	0.029 187
DCP 6	-099	2.080	0.511 146	0.201 221	0.062 280	0.025 224	0.026 259	0.015 333	0.011 123	0.019 120	0.019 120	0.019 120	0.019 120	0.019 120	0.019 120
DCP 7	-149	1.703	0.300 170	0.102 191	0.032 219	0.034 195	0.031 230	0.016 232	0.004 337	0.012 69	0.008 145	0.008 145	0.008 145	0.008 145	0.008 145
DCP 8	-200	1.482	0.307 126	0.124 214	0.041 271	0.082 352	0.011 46	0.006 73	0.012 265	0.002 287	0.002 287	0.002 287	0.002 287	0.002 287	0.002 287
DCP 9	-250	1.390	0.302 114	0.130 186	0.098 247	0.074 321	0.013 270	0.006 73	0.012 210	0.010 263	0.010 263	0.010 263	0.010 263	0.010 263	0.010 263
DCP 10	-300	1.220	0.246 96	0.106 171	0.087 245	0.071 256	0.023 255	0.014 1	0.013 134	0.013 134	0.013 134	0.013 134	0.013 134	0.013 134	0.013 134
DCP 11	-399	1.020	0.233 75	0.070 158	0.051 239	0.019 209	0.034 248	0.014 337	0.001 64	0.013 27	0.013 27	0.013 27	0.013 27	0.013 27	0.013 27
DCP 12	-501	0.784	0.223 42	0.040 135	0.026 171	0.014 157	0.028 206	0.018 269	0.008 289	0.010 318	0.010 318	0.010 318	0.010 318	0.010 318	0.010 318
DCP 13	-600	0.621	0.223 42	0.012 133	0.026 171	0.014 157	0.028 206	0.018 269	0.008 289	0.010 318	0.010 318	0.010 318	0.010 318	0.010 318	0.010 318
DCP 14	-701	0.512	0.219 33	0.009 26	0.019 287	0.031 96	0.021 139	0.009 162	0.008 116	0.009 127	0.009 127	0.009 127	0.009 127	0.009 127	0.009 127
DCP 15	-800	0.356	0.222 24	0.025 32	0.016 259	0.019 105	0.018 139	0.005 132	0.006 152	0.010 57	0.010 57	0.010 57	0.010 57	0.010 57	0.010 57
DCP 16	-900	0.108	0.134 26	0.029 45	0.011 199	0.006 90	0.006 86	0.006 110	0.005 249	0.004 79	0.004 79	0.004 79	0.004 79	0.004 79	0.004 79
DCP 17	-969	0.006	0.063 33	0.019 67	0.006 231	0.002 277	0.000 73	0.004 182	0.002 178	0.004 85	0.004 85	0.004 85	0.004 85	0.004 85	0.004 85

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL				CYCLES ANALYSED			
		TUNED MZ		DRIVE MZ		K		MACH NO		DEL-ALPHA		DEL-H		ALPHA-0		TEST POINT		EXT DAMP	
		0.0	167.0 (549.0)	45.35	0.138	0.501	5.33	0.501	5.33	0.501	5.33	0.0	0.0	9.94	0.0	12039.5	20	0.0	0.0
ALPHA																			
CM																			
DCP 1	-0.10	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 2	-0.20	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 3	-0.30	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 4	-0.40	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 5	-0.50	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 6	-0.60	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 7	-0.70	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 8	-0.80	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 9	-0.90	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 10	-1.00	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 11	-1.10	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 12	-1.20	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 13	-1.30	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 14	-1.40	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 15	-1.50	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 16	-1.60	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
DCP 17	-1.70	3.725	0.303	0.181	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL				CYCLES ANALYSED			
		TUNED MZ		DRIVE MZ		K		MACH NO		DEL-ALPHA		DEL-H		ALPHA-0		TEST POINT		EXT DAMP	
		0.0	170.4 (559.2)	45.65	0.134	0.506	5.23	0.506	5.23	0.506	5.23	0.0	0.0	12.01	0.0	12041.1	20	0.0	0.0
ALPHA																			
CM																			
DCP 1	-0.10	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 2	-0.20	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 3	-0.30	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 4	-0.40	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 5	-0.50	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 6	-0.60	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 7	-0.70	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 8	-0.80	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 9	-0.90	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 10	-1.00	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 11	-1.10	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 12	-1.20	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 13	-1.30	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 14	-1.40	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 15	-1.50	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 16	-1.60	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161
DCP 17	-1.70	3.937	0.477	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161	0.161

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible][illegible]

DATA TYPE	A/C	NUMERICAL ANALYSIS										RES 8 PMI	RES 9 PMI
		RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI			
ALPHA		0.721	5.9e2	0.516	0.139	0.049	0.009	0.023	0.002	0.012	0.007	0.007	
W		0.617	0.001	0.026	0.003	0.003	0.003	0.003	0.001	0.001	0.001	0.001	
CM		-0.021	0.031	0.006	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.001	
DCP 1	0.310	-0.008	2.0e2	0.169	0.221	0.181	-0.133	0.000	0.026	0.000	0.026	0.026	
DCP 2	0.020	-0.190	0.250	0.127	0.067	0.022	0.038	0.000	0.036	0.030	0.033	0.033	
DCP 3	0.030	-0.012	0.027	0.155	0.072	0.071	0.251	0.001	0.010	0.015	0.014	0.014	
DCP 4	0.060	0.271	1.733	0.125	0.066	0.003	0.034	0.007	0.009	0.003	0.007	0.007	
DCP 5	0.074	0.462	1.3e2	0.103	0.071	0.052	0.038	0.016	0.015	0.009	0.010	0.010	
DCP 6	0.094	0.413	1.3e2	0.103	0.071	0.052	0.038	0.016	0.015	0.009	0.010	0.010	
DCP 7	0.104	0.466	0.821	0.088	0.069	0.026	0.022	0.006	0.011	0.008	0.016	0.016	
DCP 8	0.100	0.235	0.071	0.039	0.055	0.110	0.029	0.006	0.005	0.003	0.005	0.005	
DCP 9	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 10	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 11	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 12	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 13	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 14	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 15	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 16	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 17	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 18	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 19	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 20	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 21	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 22	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 23	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 24	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 25	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 26	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 27	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 28	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 29	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	
DCP 30	0.094	0.157	0.046	0.045	0.047	0.039	0.032	0.003	0.002	0.003	0.003	0.003	

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL M	DEL ALPHA	ALPHA-0	TEST POINT	CYCLES ANALYSED
0.0	68.56	0.202	0.510	0.0	0.0	2.50	2.50	12047.2	20
AIRFOIL NR 1									
DATA TYPE	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	2.501	5.951	0.489	0.093	0.014	0.020	0.026	0.012	0.008
CM	0.360	0.444	0.001	0.004	0.001	0.004	0.001	0.002	0.001
CM	-0.009	0.032	0.294	0.001	0.000	0.001	0.000	0.000	0.000
DCP 1	0.958	1.158	0.215	0.116	0.042	0.026	0.017	0.011	0.006
DCP 2	0.913	2.476	0.204	0.090	0.079	0.032	0.014	0.010	0.006
DCP 3	0.921	1.977	0.112	0.044	0.014	0.013	0.013	0.021	0.013
DCP 4	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 5	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 6	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 7	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 8	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 9	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 10	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 11	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 12	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 13	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 14	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 15	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 16	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 17	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013

FORCED PITCHING OSCILLATION									
TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL M	DEL ALPHA	ALPHA-0	TEST POINT	CYCLES ANALYSED
0.0	68.56	0.202	0.510	0.0	0.0	2.50	2.50	12047.2	20
AIRFOIL NR 1									
DATA TYPE	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	2.501	5.951	0.489	0.093	0.014	0.020	0.026	0.012	0.008
CM	0.360	0.444	0.001	0.004	0.001	0.004	0.001	0.002	0.001
CM	-0.009	0.032	0.294	0.001	0.000	0.001	0.000	0.000	0.000
DCP 1	0.958	1.158	0.215	0.116	0.042	0.026	0.017	0.011	0.006
DCP 2	0.913	2.476	0.204	0.090	0.079	0.032	0.014	0.010	0.006
DCP 3	0.921	1.977	0.112	0.044	0.014	0.013	0.013	0.021	0.013
DCP 4	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 5	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 6	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 7	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 8	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 9	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 10	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 11	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 12	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 13	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 14	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 15	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 16	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013
DCP 17	0.949	1.755	0.121	0.044	0.013	0.013	0.013	0.021	0.013

FORCED PITCHING OSCILLATION									
AIRFOIL									
REL 1									
DATA	TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYZED
TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA	169.1	5.606	0	0.592	0.208	0.034	0.034	0.034	0.034
CM	169.1	0.529	54	0.122	0.044	0.044	0.044	0.044	0.044
CN	169.1	0.096	207	0.039	0.031	0.012	0.012	0.012	0.012
DCP 1	0.010	3.562	0.711	0.127	0.174	0.116	0.097	0.097	0.097
DCP 2	0.020	3.186	0.779	0.101	0.178	0.150	0.154	0.154	0.154
DCP 3	0.030	2.869	0.699	0.107	0.174	0.212	0.212	0.212	0.212
DCP 4	0.040	2.700	0.811	0.100	0.293	0.212	0.212	0.212	0.212
DCP 5	0.050	2.303	0.816	0.09	0.270	0.096	0.096	0.096	0.096
DCP 6	0.060	2.114	0.770	0.08	0.222	0.086	0.086	0.086	0.086
DCP 7	0.070	1.713	0.801	0.07	0.231	0.117	0.117	0.117	0.117
DCP 8	0.080	1.421	0.790	0.06	0.212	0.121	0.121	0.121	0.121
DCP 9	0.090	1.268	0.735	0.05	0.212	0.116	0.116	0.116	0.116
DCP 10	0.100	1.126	0.711	0.04	0.197	0.116	0.116	0.116	0.116
DCP 11	0.110	0.966	0.680	0.03	0.160	0.116	0.116	0.116	0.116
DCP 12	0.120	0.760	0.626	0.02	0.127	0.116	0.116	0.116	0.116
DCP 13	0.130	0.623	0.552	0.01	0.100	0.116	0.116	0.116	0.116
DCP 14	0.140	0.543	0.481	0.00	0.126	0.116	0.116	0.116	0.116
DCP 15	0.150	0.506	0.403	0.00	0.145	0.116	0.116	0.116	0.116
DCP 16	0.160	0.466	0.261	0.00	0.108	0.116	0.116	0.116	0.116
DCP 17	0.170	0.421	0.113	0.00	0.053	0.116	0.116	0.116	0.116

FORCED PITCHING OSCILLATION									
AIRFOIL									
REL 1									
DATA	TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYZED
TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA	163.5	5.641	0	0.190	0.353	0.031	0.031	0.031	0.031
CM	163.5	0.536	92	0.115	0.055	0.041	0.041	0.041	0.041
CN	163.5	0.113	211	0.050	0.023	0.019	0.019	0.019	0.019
DCP 1	0.010	1.557	0.711	0.127	0.174	0.116	0.097	0.097	0.097
DCP 2	0.020	1.349	0.779	0.101	0.178	0.150	0.154	0.154	0.154
DCP 3	0.030	1.271	0.811	0.100	0.293	0.212	0.212	0.212	0.212
DCP 4	0.040	1.211	0.816	0.09	0.270	0.096	0.096	0.096	0.096
DCP 5	0.050	1.077	0.770	0.08	0.222	0.086	0.086	0.086	0.086
DCP 6	0.060	0.781	0.801	0.07	0.231	0.117	0.117	0.117	0.117
DCP 7	0.070	0.708	0.790	0.06	0.212	0.121	0.121	0.121	0.121
DCP 8	0.080	0.698	0.735	0.05	0.212	0.116	0.116	0.116	0.116
DCP 9	0.090	0.656	0.711	0.04	0.197	0.116	0.116	0.116	0.116
DCP 10	0.100	0.587	0.680	0.03	0.160	0.116	0.116	0.116	0.116
DCP 11	0.110	0.506	0.626	0.02	0.127	0.116	0.116	0.116	0.116
DCP 12	0.120	0.481	0.552	0.01	0.100	0.116	0.116	0.116	0.116
DCP 13	0.130	0.403	0.481	0.00	0.126	0.116	0.116	0.116	0.116
DCP 14	0.140	0.353	0.403	0.00	0.145	0.116	0.116	0.116	0.116
DCP 15	0.150	0.261	0.261	0.00	0.108	0.116	0.116	0.116	0.116
DCP 16	0.160	0.113	0.113	0.00	0.053	0.116	0.116	0.116	0.116

FORCED PITCHING OSCILLATION									
AIRFOIL									
REL 1									
DATA	TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYZED
TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA	163.5	5.641	0	0.190	0.353	0.031	0.031	0.031	0.031
CM	163.5	0.536	92	0.115	0.055	0.041	0.041	0.041	0.041
CN	163.5	0.113	211	0.050	0.023	0.019	0.019	0.019	0.019
DCP 1	0.010	1.557	0.711	0.127	0.174	0.116	0.097	0.097	0.097
DCP 2	0.020	1.349	0.779	0.101	0.178	0.150	0.154	0.154	0.154
DCP 3	0.030	1.271	0.811	0.100	0.293	0.212	0.212	0.212	0.212
DCP 4	0.040	1.211	0.816	0.09	0.270	0.096	0.096	0.096	0.096
DCP 5	0.050	1.077	0.770	0.08	0.222	0.086	0.086	0.086	0.086
DCP 6	0.060	0.781	0.801	0.07	0.231	0.117	0.117	0.117	0.117
DCP 7	0.070	0.708	0.790	0.06	0.212	0.121	0.121	0.121	0.121
DCP 8	0.080	0.698	0.735	0.05	0.212	0.116	0.116	0.116	0.116
DCP 9	0.090	0.656	0.711	0.04	0.197	0.116	0.116	0.116	0.116
DCP 10	0.100	0.587	0.680	0.03	0.160	0.116	0.116	0.116	0.116
DCP 11	0.110	0.506	0.626	0.02	0.127	0.116	0.116	0.116	0.116
DCP 12	0.120	0.481	0.552	0.01	0.100	0.116	0.116	0.116	0.116
DCP 13	0.130	0.403	0.481	0.00	0.126	0.116	0.116	0.116	0.116
DCP 14	0.140	0.353	0.403	0.00	0.145	0.116	0.116	0.116	0.116
DCP 15	0.150	0.261	0.261	0.00	0.108	0.116	0.116	0.116	0.116
DCP 16	0.160	0.113	0.113	0.00	0.053	0.116	0.116	0.116	0.116

FORCED PITCHING OSCILLATION									
TUNE MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	68.84	0.200	0.524	5.95	0.0	0.05	12049.1	20	
V	U	RM	CH(MIN)	CH(MAX)	ALPHA-MIN	AERO DAMP	TDR	EXT DAMP	
		0.82E 07	-0.052	0.554	6.38	-0.00066	0.950	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		0.048	0.046	0.517 343	0.111 204	0.057 152	0.008 108	0.022 68	0.007 177
CN		0.106	0.447 358	0.029 6	0.007 233	0.004 204	0.004 254	0.002 104	0.001 215
CM		-0.015	0.031 293	0.006 286	0.001 103	0.001 56	0.001 160	0.001 300	0.001 352
DCP 1	0.010	-0.733	2.994 339	0.171 288	0.212 262	0.182 333	0.096 27	0.045 98	0.015 347
DCP 2	0.020	-0.409	2.348 346	0.150 359	0.043 208	0.102 264	0.021 317	0.036 93	0.031 183
DCP 3	0.030	-0.193	2.108 345	0.160 352	0.079 131	0.062 177	0.043 246	0.014 10	0.010 137
DCP 4	0.040	0.126	1.753 346	0.144 345	0.074 119	0.067 163	0.033 223	0.024 237	0.014 2
DCP 5	0.074	0.268	1.368 347	0.114 335	0.029 110	0.033 135	0.036 196	0.018 246	0.020 275
DCP 6	0.099	0.237	1.156 349	0.086 334	0.005 198	0.017 137	0.023 193	0.008 264	0.009 318
DCP 7	0.149	0.237	0.836 351	0.053 334	0.018 229	0.001 155	0.007 186	0.004 107	0.003 254
DCP 8	0.200	0.183	0.686 359	0.045 351	0.016 262	0.005 296	0.003 3	0.005 69	0.002 175
DCP 9	0.250	0.174	0.591 356	0.045 354	0.008 254	0.007 164	0.001 146	0.006 95	0.001 155
DCP 10	0.300	0.160	0.495 358	0.037 2	0.005 242	0.006 217	0.006 251	0.007 105	0.001 119
DCP 11	0.399	0.147	0.399 12	0.034 30	0.009 274	0.006 234	0.006 274	0.006 163	0.002 239
DCP 12	0.501	0.110	0.307 18	0.031 34	0.010 277	0.005 258	0.003 287	0.002 121	0.001 7
DCP 13	0.600	0.117	0.237 25	0.023 53	0.010 262	0.005 236	0.007 322	0.002 39	0.001 20
DCP 14	0.701	0.195	0.169 33	0.024 53	0.006 261	0.005 198	0.007 345	0.003 70	0.002 189
DCP 15	0.800	0.092	0.105 45	0.022 67	0.007 257	0.002 201	0.004 343	0.004 117	0.003 195
DCP 16	0.900	-0.088	0.045 86	0.018 134	0.005 178	0.005 238	0.007 0	0.004 133	0.004 148
DCP 17	0.954	-0.046	0.036 172	0.011 158	0.000 199	0.006 109	0.004 168	0.003 125	0.007 203

FORCED PITCHING OSCILLATION									
TUNE MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	68.87	0.202	0.520	5.93	0.0	2.49	12049.2	20	
V	U	RM	CH(MIN)	CH(MAX)	ALPHA-MIN	AERO DAMP	TDR	EXT DAMP	
		0.82E 07	-0.042	0.806	8.73	-0.00065	0.935	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7
ALPHA		2.486	5.925 0	0.502 341	0.106 197	0.016 190	0.026 153	0.019 99	0.013 204
CN		0.358	0.444 357	0.034 356	0.002 263	0.001 341	0.003 235	0.003 237	0.001 164
CM		-0.008	0.032 297	0.007 251	0.001 165	0.000 292	0.000 170	0.001 106	0.000 8
DCP 1	0.010	0.952	3.174 337	0.216 265	0.133 111	0.033 12	0.024 194	0.008 38	0.016 229
DCP 2	0.020	0.928	2.497 345	0.215 269	0.139 147	0.007 46	0.044 244	0.044 198	0.017 110
DCP 3	0.030	0.936	2.014 346	0.116 321	0.020 302	0.009 334	0.049 264	0.041 183	0.045 91
DCP 4	0.040	1.105	1.765 346	0.128 323	0.020 252	0.021 194	0.016 146	0.013 251	0.013 251
DCP 5	0.074	1.036	1.411 346	0.103 316	0.013 241	0.007 219	0.008 171	0.005 194	0.002 251
DCP 6	0.099	0.971	1.168 348	0.084 331	0.017 271	0.006 212	0.013 198	0.003 151	0.001 227
DCP 7	0.149	0.703	0.846 351	0.041 337	0.013 279	0.010 209	0.006 214	0.001 164	0.002 278
DCP 8	0.200	0.558	0.686 358	0.034 359	0.010 284	0.003 330	0.008 214	0.004 244	0.001 101
DCP 9	0.250	0.493	0.583 356	0.038 356	0.013 273	0.004 300	0.006 196	0.003 143	0.002 150
DCP 10	0.300	0.429	0.482 357	0.030 0	0.006 262	0.002 296	0.004 196	0.003 144	0.002 168
DCP 11	0.399	0.362	0.385 12	0.035 23	0.002 420	0.002 291	0.003 247	0.004 268	0.002 150
DCP 12	0.501	0.274	0.274 17	0.034 27	0.003 338	0.004 317	0.006 264	0.003 232	0.001 144
DCP 13	0.600	0.243	0.243 25	0.034 61	0.004 317	0.004 244	0.006 264	0.003 263	0.001 211
DCP 14	0.701	0.154	0.154 33	0.033 50	0.002 2	0.003 12	0.004 264	0.003 263	0.001 114
DCP 15	0.800	0.133	0.095 47	0.032 57	0.002 14	0.001 69	0.003 164	0.003 263	0.001 114
DCP 16	0.900	-0.062	0.038 80	0.007 52	0.002 319	0.003 116	0.003 264	0.003 263	0.001 21
DCP 17	0.954	-0.026	0.026 175	0.004 131	0.002 240	0.002 26	0.003 17	0.003 133	0.001 246

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 23.03	K 0.059	MACH NO 0.604	DEL-ALPHA 5.19	DEL-H 0.0	ALPHA-0 0.31	ALPHA-0 0.31	TEST POINT 12055.1	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA													
CN													
CM													
DCP 1	.010	-0.737	2.018 347	0.200 264	0.307 306	0.125 5	0.057 73	0.043 7	0.035 60	0.011 298	0.011 298	0.028 20	0.028 20
DCP 2	.020	-0.523	2.308 349	0.075 298	0.150 306	0.123 9	0.086 94	0.001 107	0.053 74	0.009 285	0.009 285	0.004 141	0.004 141
DCP 3	.030	-0.282	2.198 348	0.103 34	0.018 231	0.036 336	0.067 97	0.044 175	0.004 245	0.022 165	0.022 165	0.028 228	0.028 228
DCP 4	.040	0.125	1.949 349	0.074 32	0.073 154	0.045 242	0.038 79	0.042 154	0.035 240	0.016 307	0.016 307	0.008 278	0.008 278
DCP 5	.074	0.353	1.737 349	0.046 326	0.099 147	0.052 217	0.019 305	0.014 60	0.022 248	0.013 309	0.013 309	0.011 59	0.011 59
DCP 6	.099	0.453	1.549 350	0.110 275	0.114 151	0.015 190	0.024 294	0.028 39	0.021 278	0.010 221	0.010 221	0.009 55	0.009 55
DCP 7	.149	0.244	0.915 350	0.062 36	0.011 10	0.045 206	0.010 263	0.017 347	0.008 46	0.006 13	0.006 13	0.704 195	0.704 195
DCP 8	.200	0.214	0.744 353	0.027 355	0.015 332	0.018 212	0.005 295	0.010 22	0.005 52	0.006 81	0.006 81	8.005 133	8.005 133
DCP 9	.250	0.209	0.725 353	0.014 345	0.018 296	0.010 219	0.001 306	0.003 14	0.003 346	0.003 69	0.003 69	0.700 44	0.700 44
DCP10	.300	0.199	0.603 353	0.009 337	0.018 297	0.004 234	0.001 306	0.001 110	0.004 0	0.003 59	0.003 59	0.61 194	0.61 194
DCP11	.399	0.184	0.477 357	0.008 299	0.016 292	0.002 283	0.001 95	0.002 138	0.004 16	0.002 49	0.002 49	0.001 152	0.001 152
DCP12	.501	0.138	0.356 359	0.008 263	0.016 294	0.003 315	0.002 64	0.001 193	0.001 10	0.002 10	0.002 10	0.002 229	0.002 229
DCP13	.600	0.153	0.260 1	0.008 248	0.016 294	0.003 298	0.003 14	0.001 116	0.001 52	0.001 96	0.001 96	0.005 149	0.005 149
DCP14	.701	0.230	0.172 3	0.002 184	0.015 288	0.004 278	0.002 7	0.002 108	0.001 70	0.002 21	0.002 21	0.003 248	0.003 248
DCP15	.800	0.101	-0.083 13	0.010 205	0.015 295	0.003 298	0.002 14	0.002 165	0.002 122	0.001 315	0.001 315	0.003 247	0.003 247
DCP16	.901	-0.093	0.021 117	0.021 208	0.013 276	0.005 274	0.001 238	0.003 354	0.002 130	0.000 17	0.000 17	0.002 242	0.002 242
DCP17	.969	-0.050	0.043 172	0.009 221	0.004 255	0.002 240	0.005 355	0.001 69	0.002 331	0.001 235	0.001 235	0.001 191	0.001 191

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 23.07	K 0.059	MACH NO 0.601	DEL-ALPHA 5.20	DEL-H 0.0	ALPHA-0 2.38	ALPHA-0 2.38	TEST POINT 12055.2	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA													
CN													
CM													
DCP 1	.010	-0.596	3.289 347	0.370 40	0.044 85	0.046 202	0.022 183	0.008 131	0.013 236	0.020 344	0.020 344	0.010 348	0.010 348
DCP 2	.020	0.724	2.627 349	0.144 12	0.009 311	0.016 127	0.024 243	0.048 18	0.027 28	0.033 153	0.033 153	0.033 236	0.033 236
DCP 3	.030	0.877	2.280 349	0.102 359	0.024 280	0.039 17	0.007 114	0.016 73	0.031 290	0.013 244	0.013 244	0.004 327	0.004 327
DCP 4	.040	1.128	2.026 349	0.095 17	0.052 312	0.016 64	0.032 309	0.012 140	0.024 287	0.015 240	0.015 240	0.008 153	0.008 153
DCP 5	.074	1.241	1.853 349	0.069 342	0.041 313	0.016 233	0.027 316	0.024 199	0.005 310	0.013 185	0.013 185	0.014 195	0.014 195
DCP 6	.099	1.319	1.600 350	0.100 287	0.073 321	0.016 229	0.010 329	0.004 209	0.018 113	0.013 263	0.013 263	0.003 95	0.003 95
DCP 7	.149	0.977	1.426 352	0.261 273	0.114 175	0.033 157	0.108 133	0.116 85	0.048 295	0.011 29	0.011 29	0.043 789	0.043 789
DCP 8	.200	0.417	0.875 355	0.084 331	0.040 194	0.052 54	0.039 340	0.010 287	0.11 377	0.006 156	0.006 156	0.001 197	0.001 197
DCP 9	.250	0.552	0.720 355	0.058 18	0.017 208	0.052 54	0.033 320	0.032 235	0.013 147	0.013 159	0.013 159	0.012 10	0.012 10
DCP10	.300	0.449	0.566 354	0.055 43	0.017 208	0.036 18	0.032 320	0.032 235	0.013 147	0.013 159	0.013 159	0.002 377	0.002 377
DCP11	.399	0.389	0.442 358	0.058 43	0.030 322	0.005 199	0.002 338	0.005 234	0.001 28	0.002 47	0.002 47	0.003 174	0.003 174
DCP12	.501	0.289	0.333 359	0.045 40	0.017 314	0.005 206	0.002 303	0.002 270	0.001 28	0.002 47	0.002 47	0.003 174	0.003 174
DCP13	.600	0.257	0.247 1	0.039 41	0.016 307	0.004 194	0.002 303	0.002 270	0.001 28	0.002 47	0.002 47	0.003 174	0.003 174
DCP14	.701	0.251	0.148 5	0.039 48	0.016 307	0.005 198	0.002 303	0.002 270	0.001 28	0.002 47	0.002 47	0.003 174	0.003 174
DCP15	.800	0.127	0.082 11	0.021 44	0.011 291	0.003 154	0.002 303	0.002 270	0.001 28	0.002 47	0.002 47	0.003 174	0.003 174
DCP16	.900	-0.102	0.019 31	0.002 334	0.007 270	0.003 124	0.003 337	0.002 313	0.002 121	0.001 94	0.001 94	0.009 270	0.009 270
DCP17	.969	-0.067	0.024 177	0.007 258	0.004 193	0.001 44	0.002 337	0.002 313	0.002 121	0.001 210	0.001 210	0.002 247	0.002 247

HARMONIC ANALYSIS

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
DATA TYPE	X/C	TUNED MZ 0.0	DRIVE MZ 23.07	K 0.060	MACH NO 0.598	DEL-ALPHA 5.19	DEL-H 0.0	ALPHA-0 5.02	TEST POINT 12055.3
ALPHA									
CM									
DCP 1	-0.10	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
DCP 2	-0.20	5.021	5.188 0	0.224 13	0.030 268	0.015 324	0.030 330	0.020 234	0.043 86
DCP 3	-0.30	0.635	0.446 359	0.106 36	0.044 327	0.029 268	0.021 190	0.011 123	0.009 79
DCP 4	-0.40	0.004	0.026 323	0.005 180	0.005 24	0.002 304	0.002 288	0.002 227	0.002 117
DCP 5	-0.50	2.045	2.232 348	0.471 47	0.100 336	0.017 324	0.025 305	0.011 275	0.012 9
DCP 6	-0.60	1.905	2.126 352	0.324 41	0.085 338	0.046 261	0.009 157	0.025 239	0.023 104
DCP 7	-0.70	1.919	1.909 352	0.262 36	0.064 332	0.048 254	0.022 150	0.024 234	0.031 109
DCP 8	-0.80	2.011	1.624 351	0.305 50	0.083 354	0.065 304	0.061 183	0.027 124	0.055 86
DCP 9	-0.90	1.945	1.441 350	0.335 60	0.109 354	0.103 305	0.086 204	0.047 113	0.057 80
DCP 10	-0.95	1.956	1.335 350	0.416 65	0.282 345	0.093 304	0.070 226	0.040 93	0.050 98
DCP 11	-1.00	1.421	1.080 358	0.250 36	0.281 338	0.147 264	0.097 294	0.139 220	0.014 158
DCP 12	-1.05	0.819	0.673 359	0.162 358	0.058 317	0.104 265	0.080 185	0.024 155	0.038 125
DCP 13	-1.10	0.909	0.673 359	0.103 357	0.024 286	0.049 253	0.077 165	0.034 102	0.040 102
DCP 14	-1.15	0.766	0.530 1	0.103 357	0.027 270	0.049 250	0.068 168	0.034 96	0.037 18
DCP 15	-1.20	0.595	0.363 5	0.086 29	0.017 282	0.012 244	0.027 163	0.030 78	0.019 6
DCP 16	-1.25	0.426	0.246 10	0.084 37	0.018 294	0.006 227	0.011 144	0.013 59	0.004 341
DCP 17	-1.30	0.326	0.155 18	0.082 44	0.020 308	0.005 259	0.006 183	0.009 72	0.004 340
DCP 18	-1.35	0.149	0.053 51	0.083 50	0.018 315	0.003 324	0.004 228	0.003 75	0.003 298
DCP 19	-1.40	-0.087	0.037 35	0.084 32	0.014 265	0.003 138	0.004 107	0.004 24	0.005 249
DCP 20	-1.45	-0.076	0.008 149	0.013 285	0.015 225	0.006 143	0.003 132	0.004 50	0.004 290
DCP 21	-1.50				0.004 237	0.003 225	0.004 124	0.003 56	0.003 266

TEST POINT
12055.3

EXT DAMP
0.0

ALPHA-0
5.02

AERO DAMP
-0.00116

DEL-ALPHA
5.19

DEL-H
0.0

ALPHA-MAX
9.48

RES 9 PHI

RES 8 PHI

RES 7 PHI

RES 6 PHI

RES 5 PHI

RES 4 PHI

RES 3 PHI

RES 2 PHI

RES 1 PHI

RES 0

RES 9 PHI

RES 8 PHI

RES 7 PHI

RES 6 PHI

RES 5 PHI

RES 4 PHI

RES 3 PHI

RES 2 PHI

RES 1 PHI

RES 0

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
DATA TYPE	X/C	TUNED MZ 0.0	DRIVE MZ 23.01	K 0.060	MACH NO 0.591	DEL-ALPHA 5.07	DEL-H 0.0	ALPHA-0 7.49	TEST POINT 12055.4
ALPHA									
CM									
DCP 1	-0.10	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
DCP 2	-0.20	7.489	5.065 0	0.254 27	0.031 275	0.029 86	0.053 39	0.063 4	0.110 72
DCP 3	-0.30	0.805	0.266 14	0.144 53	0.038 33	0.053 17	0.029 325	0.014 278	0.012 271
DCP 4	-0.40	-0.002	0.020 252	0.020 100	0.005 8	0.005 90	0.004 14	0.002 5	0.001 318
DCP 5	-0.50	2.930	1.327 350	0.596 42	0.121 44	0.072 10	0.017 302	0.031 235	0.045 158
DCP 6	-0.60	2.677	1.255 352	0.508 71	0.172 36	0.097 19	0.382 325	0.039 292	0.043 220
DCP 7	-0.70	2.592	1.123 351	0.444 75	0.193 35	0.095 9	0.086 325	0.049 317	0.049 450
DCP 8	-0.80	2.476	0.831 348	0.364 76	0.160 36	0.053 46	0.117 357	0.061 299	0.063 276
DCP 9	-0.90	2.348	0.420 344	0.461 73	0.119 35	0.052 67	0.132 354	0.041 273	0.058 301
DCP 10	-1.00	2.251	0.311 353	0.763 70	0.091 90	0.157 61	0.113 356	0.045 266	0.045 266
DCP 11	-1.10	1.668	0.445 20	0.283 63	0.126 25	0.264 51	0.062 5	0.045 262	0.045 262
DCP 12	-1.20	1.288	0.511 27	0.277 53	0.166 12	0.373 11	0.108 323	0.023 310	0.041 2
DCP 13	-1.30	1.181	0.472 11	0.178 46	0.129 357	0.050 326	0.046 315	0.034 269	0.041 2
DCP 14	-1.40	0.967	0.404 14	0.126 32	0.070 50	0.151 311	0.064 312	0.034 269	0.041 2
DCP 15	-1.50	0.789	0.314 18	0.077 16	0.040 3	0.133 320	0.022 287	0.024 237	0.041 2
DCP 16	-1.60	0.577	0.234 24	0.062 4	0.012 101	0.021 318	0.010 268	0.024 237	0.041 2
DCP 17	-1.70	0.450	0.155 36	0.050 4	0.022 135	0.015 347	0.007 251	0.009 236	0.041 2
DCP 18	-1.80	0.389	0.098 70	0.044 392	0.031 159	0.010 19	0.008 204	0.008 153	0.041 2
DCP 19	-1.90	0.149	0.087 49	0.039 318	0.018 156	0.012 315	0.008 102	0.008 102	0.041 2
DCP 20	-2.00	-0.050	0.063 21	0.038 296	0.004 279	0.011 275	0.007 208	0.004 183	0.041 2
DCP 21	-2.10	-0.072	0.026 23	0.022 287	0.003 316	0.008 298	0.004 232	0.004 192	0.041 2

TEST POINT
12055.4

EXT DAMP
0.0

ALPHA-0
7.49

AERO DAMP
-0.00129

DEL-ALPHA
5.07

DEL-H
0.0

ALPHA-MAX
9.97

RES 9 PHI

RES 8 PHI

RES 7 PHI

RES 6 PHI

RES 5 PHI

RES 4 PHI

RES 3 PHI

RES 2 PHI

RES 1 PHI

RES 0

RES 9 PHI

RES 8 PHI

RES 7 PHI

RES 6 PHI

RES 5 PHI

RES 4 PHI

RES 3 PHI

RES 2 PHI

RES 1 PHI

RES 0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible]

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL		MCM 1		TEST POINT 12057.3	CYCLES ANALYSED 20						
		TUNED F2 0.0	DRIVE F2 23.12	K	MACH NO 0.599	DEL-ALPHA 4.92	DEL-M 0.0	ALPHA-0 14.85	RES 5 PMI			RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI		
V	196.6 (645.1)	Q	RN	CHIMIKI -0.100	CN(MAX) 1.167	ALP-12 NMAX 17.48	AFRD DAMP -0.00165	YOR 2.269	EXT DAMP 0.0								
												RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	R-S 4 PMI	RES 5 PMI
ALPHA-4	14.849	4.422	0	0.208	3	0.025	279	0.033	10	0.023	24	0.011	74	0.028	130	0.010	305
DEL-M	1.010	3.167	71	0.013	253	0.009	348	0.005	213	0.006	287	0.002	11	0.004	185	0.803	202
DEL-N	-0.843	0.054	149	0.006	233	0.001	105	0.001	43	0.002	38	0.001	22	0.002	328	0.001	47
DCP 1	4.230	0.392	144	0.032	55	0.021	199	0.019	493	0.002	154	0.012	332	0.024	327	0.035	276
DCP 2	3.321	0.530	143	0.037	41	0.031	238	0.026	137	0.029	345	0.024	327	0.024	326	0.043	266
DCP 3	3.013	0.624	164	0.033	35	0.019	174	0.018	282	0.032	260	0.032	286	0.030	198	0.007	240
DCP 4	0.444	0.539	150	0.108	251	0.050	278	0.022	335	0.012	321	0.022	32	0.003	92	0.006	1
DCP 5	0.074	0.256	0.463	0.219	251	0.088	345	0.032	355	0.040	356	0.030	77	0.015	85	0.009	198
DCP 6	0.094	0.442	136	0.147	252	0.062	351	0.018	57	0.019	40	0.047	31	0.044	19	0.009	9
DCP 7	1.149	0.228	100	0.015	338	0.050	23	0.015	137	0.016	276	0.017	4	0.027	72	0.017	258
DCP 8	1.499	0.125	102	0.046	245	0.020	337	0.020	223	0.044	16	0.017	290	0.010	174	0.011	230
DCP 9	1.552	0.148	101	0.033	227	0.012	303	0.032	278	0.048	308	0.001	89	0.004	122	0.002	129
DCP10	1.242	0.150	85	0.034	191	0.017	64	0.011	195	0.013	249	0.017	327	0.004	42	0.005	170
DCP11	1.085	0.196	60	0.031	158	0.018	173	0.015	239	0.023	296	0.019	287	0.009	337	0.014	144
DCP12	0.828	0.222	45	0.025	98	0.003	192	0.017	133	0.016	236	0.006	236	0.004	20	0.014	144
DCP13	0.645	0.233	22	0.033	48	0.009	0	0.008	133	0.006	166	0.010	177	0.007	161	0.007	149
DCP14	0.590	0.221	27	0.029	31	0.016	307	0.006	274	0.006	126	0.008	160	0.007	193	0.010	166
DCP15	0.372	0.216	20	0.017	9	0.011	295	0.001	273	0.004	9	0.011	217	0.010	197	0.004	239
DCP16	0.105	0.149	27	0.031	17	0.002	230	0.003	303	0.006	0	0.001	70	0.036	212	0.004	178
DCP17	0.008	0.058	36	0.014	34	0.002	228	0.005	308	0.032	102	0.001	70	0.036	212	0.004	178

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible]

FORCED PITCHING OSCILLATION										AIRFOIL NLR 1										CYCLES ANALYSED									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	DEL-ALPHA	DEL-H	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	ALPHA-0	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT	TEST POINT
0.0	23.21	0.060	0.599	4.94	0.0	12.31	12.31	12.31	12.31	4.94	0.0	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12.31	12099.6	12099.6	12099.6	12099.6	12099.6	12099.6	12099.6	12099.6	12099.6	12099.6
V	Q	RN	CM(MIN)	CM(MAX)	ALPHA-MAX	AERO DAMP	AERO DAMP	AERO DAMP	AERO DAMP	CM(MIN)	CM(MAX)	ALPHA-MAX	AERO DAMP	AERO DAMP	AERO DAMP	AERO DAMP	AERO DAMP	AERO DAMP	AERO DAMP	TDR	TDR	TDR	TDR	TDR	TDR	TDR	TDR	TDR	TDR
196.8 (645.6)	68201. (1424.4)	0.62E 07	-0.099	1.097	11.42	-0.00122	-0.00122	-0.00122	-0.00122	1.097	11.42	-0.00122	-0.00122	-0.00122	-0.00122	-0.00122	-0.00122	-0.00122	-0.00122	1.914	1.914	1.914	1.914	1.914	1.914	1.914	1.914	1.914	1.914
HARMONIC ANALYSIS										HARMONIC ANALYSIS										HARMONIC ANALYSIS									
DATA TYPE	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16	RES 17	RES 18	RES 19	RES 20	RES 21	RES 22	RES 23	RES 24	RES 25	RES 26	RES 27	RES 28
ALPHA	12.306	4.937	0	0.048	0.012	0.027	0.019	0.032	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
CM	0.926	0.156	91	0.024	0.006	0.007	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
DCP 1	3.409	0.158	143	0.154	0.096	0.159	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015	0.077	0.015
DCP 2	3.307	0.129	159	0.211	0.102	0.155	0.038	0.127	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
DCP 3	3.082	0.234	172	0.234	0.117	0.170	0.050	0.126	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
DCP 4	2.419	0.902	169	0.164	0.257	0.183	0.029	0.285	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083	0.083
DCP 5	2.241	0.898	165	0.088	0.154	0.177	0.070	0.280	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
DCP 6	2.087	0.670	140	0.166	0.056	0.165	0.056	0.288	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034	0.034
DCP 7	1.755	0.459	145	0.151	0.013	0.099	0.013	0.099	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
DCP 8	1.485	0.396	124	0.013	0.005	0.158	0.005	0.158	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 9	1.335	0.299	106	0.070	0.016	0.139	0.016	0.139	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 10	1.131	0.242	77	0.093	0.004	0.135	0.004	0.135	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 11	0.930	0.230	52	0.077	0.006	0.144	0.006	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 12	0.730	0.238	42	0.046	0.004	0.144	0.004	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 13	0.583	0.246	34	0.024	0.003	0.144	0.003	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 14	0.493	0.219	25	0.037	0.002	0.144	0.002	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 15	0.324	0.228	15	0.022	0.002	0.144	0.002	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 16	0.075	0.188	5	0.013	0.001	0.144	0.001	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
DCP 17	-0.019	0.061	3	0.010	0.003	0.144	0.003	0.144	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003

REPRODUCIBILITY OF THE
ORIGINAL PAGE

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED				
		TUNED M2 0.0	DRIVE M2 45.83	K 0.119	MACH NO 0.992	DEL-ALPHA 5.16	DEL-M 0.0	ALPHA-0 12.54	TEST POINT 12067.1	RES 7 PHI	RES 8 PHI	RES 9 PHI	TEST POINT 12067.1	
V	Q	195.5 (641.4)	101037. (2110.2)	RN 0.93E 07	CHIMIN) -0.116	CNHMAX) 1.410	ALPHA.NMAX 12.66	AERO DAMP -0.00140	TOR 2.220	EST DAMP 0.0	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA	CM	CM	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	RES 10 PHI	RES 11 PHI
DCP 1	-010	3.441	0.254	152	0.219	88	0.167	152	0.064	93	0.039	157	0.024	157
DCP 2	-020	3.220	0.220	159	0.250	132	0.160	168	0.098	121	0.042	142	0.040	157
DCP 3	-030	3.209	0.176	111	0.254	65	0.143	155	0.094	96	0.020	160	0.029	92
DCP 4	-040	2.783	0.531	154	0.176	79	0.244	162	0.035	137	0.084	170	0.018	206
DCP 5	-074	2.596	0.837	147	0.084	57	0.069	153	0.069	225	0.071	152	0.056	237
DCP 6	-099	2.370	0.897	152	0.020	179	0.245	143	0.122	215	0.033	116	0.076	226
DCP 7	-149	2.018	0.857	135	0.199	198	0.082	113	0.075	189	0.016	309	0.021	291
DCP 8	-200	1.553	0.540	105	0.191	129	0.144	149	0.067	206	0.012	270	0.009	158
DCP 9	-250	1.388	0.453	79	0.173	87	0.145	115	0.064	168	0.012	90	0.028	126
DCP 10	-300	1.195	0.441	67	0.168	92	0.125	110	0.071	154	0.015	192	0.023	211
DCP 11	-399	0.985	0.425	58	0.088	75	0.076	67	0.048	110	0.032	99	0.040	143
DCP 12	-501	0.782	0.382	48	0.038	78	0.051	34	0.045	88	0.016	58	0.035	117
DCP 13	-600	0.632	0.354	45	0.012	53	0.051	23	0.036	52	0.017	5	0.023	79
DCP 14	-701	0.527	0.284	45	0.012	237	0.059	350	0.030	19	0.012	340	0.027	35
DCP 15	-800	0.333	0.259	36	0.013	6	0.056	357	0.032	14	0.021	4	0.020	345
DCP 16	-900	0.053	0.199	25	0.036	26	0.044	357	0.030	354	0.018	12	0.009	286
DCP 17	-969	-0.023	0.081	27	0.023	49	0.022	28	0.021	357	0.003	52	0.018	352

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-O	TEST POINT	CYCLES ANALYSED	
0.0	45.88	0.121	0.587	5.15	0.0	15.09	12067.2	20	EXT DAMP
V	Q	RN	CHIMINI	CHIMAXI	ALPHA-MNAX	AERO DAMP	TOR	0.0	0.0
193.6	99778.	0.92E 07	-0.116	1.297	13.20	-0.00167	2.018		
(635.3)	(2083.9)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	15.092	5.153	0	0.051 277	0.074 120	0.004 82	0.015 35	0.019 221	0.008 96
CN	1.041	0.256 78	0.034 166	0.013 184	0.007 217	0.005 239	0.001 352	0.003 317	0.003 256
CM	-0.042	0.077 213	0.012 250	0.004 341	0.003 282	0.002 335	0.000 28	0.002 90	0.002 96
DCP 1	3.408	0.520 145	0.103 95	0.125 159	0.036 228	0.046 120	0.024 118	0.011 105	0.024 224
DCP 2	0.020	0.448 148	0.075 76	0.130 175	0.053 248	0.048 171	0.026 266	0.007 51	0.024 266
DCP 3	0.030	0.622 171	0.037 96	0.134 191	0.048 270	0.048 174	0.019 349	0.009 58	0.020 62
DCP 4	0.049	2.743	0.434 155	0.244 268	0.121 282	0.044 336	0.010 244	0.032 42	0.010 163
DCP 5	0.074	2.543	0.983 147	0.295 286	0.044 10	0.052 259	0.047 339	0.032 82	0.002 140
DCP 6	0.094	2.343	0.512 144	0.179 218	0.007 174	0.011 319	0.030 34	0.012 136	0.002 191
DCP 7	0.149	1.943	0.385 119	0.115 206	0.027 1	0.016 158	0.019 309	0.015 125	0.011 223
DCP 8	0.200	1.806	0.356 113	0.110 203	0.026 291	0.020 196	0.012 350	0.009 371	0.011 177
DCP 9	0.250	1.467	0.344 95	0.123 187	0.021 75	0.009 181	0.012 250	0.003 352	0.012 168
DCP 10	0.399	1.300	0.358 81	0.092 188	0.012 251	0.019 287	0.010 276	0.006 352	0.007 19
DCP 11	0.597	0.865	0.377 55	0.059 151	0.017 208	0.013 276	0.010 286	0.011 307	0.017 56
DCP 12	0.600	0.883	0.356 47	0.054 115	0.031 166	0.007 173	0.010 191	0.010 286	0.019 394
DCP 13	0.701	0.555	0.308 39	0.046 77	0.011 181	0.005 84	0.005 350	0.021 330	0.011 261
DCP 14	0.800	0.383	0.295 34	0.038 50	0.013 87	0.001 294	0.005 184	0.006 255	0.016 278
DCP 15	0.900	0.104	0.207 37	0.036 31	0.016 142	0.007 107	0.007 166	0.007 189	0.011 233
DCP 16	0.969	0.008	0.090 50	0.022 27	0.013 141	0.004 35	0.006 48	0.005 159	0.014 226
DCP 17								0.003 196	0.005 42
								0.002 316	0.004 86

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-O	TEST POINT	CYCLES ANALYSED	
0.0	45.87	0.122	0.583	5.18	0.0	17.53	12067.3	20	EXT DAMP
V	Q	RN	CHIMINI	CHIMAXI	ALPHA-MNAX	AERO DAMP	TOR	0.0	0.0
191.9	98427.	0.92E 07	-0.148	1.329	17.00	-0.00184	2.861		
(629.5)	(2055.7)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA	17.528	5.182	0	0.056 292	0.074 110	0.010 94	0.024 54	0.023 203	0.016 134
CN	1.043	0.288 75	0.017 186	0.001 82	0.019 160	0.002 223	0.004 66	0.003 148	0.001 317
CM	-0.074	0.075 216	0.009 235	0.004 327	0.002 297	0.001 264	0.002 224	0.000 248	0.001 217
DCP 1	2.922	0.829 151	0.178 243	0.044 80	0.055 241	0.031 304	0.021 143	0.013 227	0.010 109
DCP 2	0.020	0.721 150	0.177 247	0.043 340	0.067 242	0.023 319	0.022 176	0.021 301	0.004 286
DCP 3	0.030	0.639 154	0.126 299	0.019 146	0.001 170	0.028 15	0.033 148	0.006 185	0.022 201
DCP 4	0.049	2.374	0.506 129	0.100 17	0.024 109	0.016 285	0.004 3	0.022 195	0.013 4
DCP 5	0.074	2.454	0.419 121	0.093 244	0.035 128	0.014 229	0.018 346	0.008 28	0.014 346
DCP 6	0.099	2.008	0.397 115	0.080 233	0.031 15	0.013 150	0.029 212	0.012 116	0.017 83
DCP 7	0.149	1.794	0.380 99	0.092 199	0.037 327	0.018 131	0.007 145	0.014 146	0.025 267
DCP 8	0.200	1.549	0.349 96	0.085 188	0.021 304	0.014 230	0.004 289	0.013 291	0.013 291
DCP 9	0.250	1.448	0.320 82	0.069 175	0.012 181	0.006 353	0.020 159	0.002 46	0.023 156
DCP 10	0.300	1.307	0.334 73	0.044 158	0.012 232	0.006 348	0.004 103	0.006 233	0.006 233
DCP 11	0.399	1.145	0.374 68	0.044 170	0.017 179	0.006 348	0.006 150	0.004 116	0.003 84
DCP 12	0.501	0.949	0.367 51	0.030 100	0.015 201	0.011 213	0.005 138	0.005 231	0.011 138
DCP 13	0.600	0.786	0.367 51	0.027 89	0.009 146	0.001 306	0.007 92	0.006 258	0.003 351
DCP 14	0.701	0.670	0.340 45	0.032 55	0.012 147	0.001 306	0.007 92	0.005 113	0.006 358
DCP 15	0.800	0.497	0.310 41	0.033 36	0.015 143	0.002 335	0.010 24	0.002 245	0.009 117
DCP 16	0.900	0.176	0.226 44	0.027 9	0.013 85	0.006 68	0.011 42	0.003 92	0.004 293
DCP 17	0.969	0.017	0.101 56	0.010 137	0.008 106	0.010 78	0.003 74	0.001 248	0.002 319

DATA TYPE	X/C	FORCED BITCHING OSCILLATION										AIRFOIL										CYCLES ANALYSED									
		TUNED MZ	RELATIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	DEL-ALPHA	DEL-M	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP	TEST POINT	EXT DAMP
ALPHA		0.0	0.0	0.181	0.992	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CM		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DCP 1		7.477	5.400	0	0.784	17	0.356	144	0.059	181	0.022	56	0.012	331	0.016	715	0.016	189	0.019	317	0.019	317	0.019	317	0.019	317	0.019	317	0.019	317	0.019
DCP 2		0.778	0.497	28	0.167	332	0.066	221	0.015	165	0.013	51	0.012	280	0.008	189	0.005	104	0.006	245	0.006	245	0.006	245	0.006	245	0.006	245	0.006	245	0.006
DCP 3		-0.011	0.067	237	0.042	75	0.025	324	0.011	248	0.010	196	0.008	99	0.005	10	0.003	278	0.003	199	0.003	199	0.003	199	0.003	199	0.003	199	0.003	199	0.003
DCP 4		2.451	1.526	340	0.545	43	0.192	301	0.105	196	0.052	76	0.038	350	0.022	701	0.024	265	0.026	176	0.026	176	0.026	176	0.026	176	0.026	176	0.026	176	0.026
DCP 5		2.488	1.436	17	0.434	48	0.233	314	0.160	218	0.031	80	0.006	164	0.006	164	0.006	164	0.006	164	0.006	164	0.006	164	0.006	164	0.006	164	0.006	164	0.006
DCP 6		2.476	1.345	156	0.343	43	0.207	315	0.144	222	0.014	69	0.005	171	0.005	171	0.005	171	0.005	171	0.005	171	0.005	171	0.005	171	0.005	171	0.005	171	0.005
DCP 7		2.288	0.878	4	0.581	39	0.251	291	0.157	207	0.015	295	0.001	171	0.001	171	0.001	171	0.001	171	0.001	171	0.001	171	0.001	171	0.001	171	0.001	171	0.001
DCP 8		2.194	0.778	12	0.627	34	0.247	274	0.060	184	0.051	253	0.008	155	0.008	155	0.008	155	0.008	155	0.008	155	0.008	155	0.008	155	0.008	155	0.008	155	0.008
DCP 9		2.092	0.785	23	0.696	33	0.247	269	0.042	43	0.114	215	0.037	115	0.037	115	0.037	115	0.037	115	0.037	115	0.037	115	0.037	115	0.037	115	0.037	115	0.037
DCP 10		1.549	1.310	37	0.514	359	0.203	308	0.128	285	0.077	269	0.030	290	0.030	290	0.030	290	0.030	290	0.030	290	0.030	290	0.030	290	0.030	290	0.030	290	0.030
DCP 11		1.263	0.884	34	0.425	351	0.154	228	0.082	205	0.075	112	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032
DCP 12		1.091	0.774	24	0.316	318	0.147	209	0.071	175	0.075	112	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032	76	0.032
DCP 13		0.957	0.676	23	0.232	307	0.117	207	0.056	118	0.072	60	0.032	311	0.032	311	0.032	311	0.032	311	0.032	311	0.032	311	0.032	311	0.032	311	0.032	311	0.032
DCP 14		0.790	0.591	33	0.198	296	0.117	187	0.051	87	0.062	28	0.032	264	0.032	264	0.032	264	0.032	264	0.032	264	0.032	264	0.032	264	0.032	264	0.032	264	0.032
DCP 15		0.586	0.478	36	0.164	287	0.096	166	0.046	55	0.091	1	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032
DCP 16		0.449	0.292	42	0.138	274	0.084	143	0.034	39	0.037	342	0.032	215	0.032	215	0.032	215	0.032	215	0.032	215	0.032	215	0.032	215	0.032	215	0.032	215	0.032
DCP 17		0.221	0.221	44	0.115	260	0.060	124	0.017	47	0.036	316	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032
DCP 18		-0.044	0.119	24	0.106	244	0.060	124	0.017	47	0.036	316	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032
DCP 19		-0.068	0.041	26	0.094	260	0.032	149	0.021	69	0.022	345	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032	244	0.032

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL		NLR 1		CYCLES ANALYSED			
		DRIVE MZ		K		MACH NO		DEL ALPHA		TEST POINT		EXT DAMP	
		TUNED MZ	Q	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA		0.0		0.016	0.084	0	0.082 349	0.153 344	0.118 153	0.034 326	0.054 98	0.024 132	0.021 229
CM		0.130		0.687 350	0.024 332	0.008 103	0.009 139	0.005 339	0.001 123	0.001 142	0.001 240	0.003 189	0.002 183
CM		-0.022		0.032 332	0.005 60	0.001 54	0.001 324	0.002 113	0.001 142	0.001 142	0.001 240	0.001 357	0.000 67
DCP 1	-0.10			2.496 345	0.180 264	0.071 339	0.259 319	0.029 7	0.108 292	0.031 1	0.035 240	0.034 316	0.008 244
DCP 2	-0.20			2.513 348	0.071 339	0.071 339	0.259 319	0.071 339	0.071 339	0.071 339	0.071 339	0.071 339	0.071 339
DCP 3	-0.30			2.530 347	0.152 37	0.223 332	0.223 332	0.112 31	0.035 341	0.035 341	0.035 341	0.035 341	0.035 341
DCP 4	-0.40			2.547 347	0.245 48	0.156 332	0.156 332	0.120 31	0.049 85	0.049 85	0.049 85	0.049 85	0.049 85
DCP 5	-0.50			2.564 346	0.339 49	0.086 330	0.086 330	0.104 24	0.100 86	0.100 86	0.100 86	0.100 86	0.100 86
DCP 6	-0.60			2.581 346	0.432 48	0.036 33	0.036 33	0.023 22	0.079 76	0.079 76	0.079 76	0.079 76	0.079 76
DCP 7	-0.70			2.598 346	0.525 48	0.132 111	0.132 111	0.171 200	0.028 93	0.028 93	0.028 93	0.028 93	0.028 93
DCP 8	-0.80			2.615 346	0.618 48	0.094 265	0.094 265	0.192 207	0.032 200	0.032 200	0.032 200	0.032 200	0.032 200
DCP 9	-0.90			2.632 346	0.711 48	0.239 267	0.239 267	0.077 197	0.035 152	0.035 152	0.035 152	0.035 152	0.035 152
DCP 10	-1.00			2.649 346	0.804 48	0.288 250	0.288 250	0.105 47	0.037 288	0.037 288	0.037 288	0.037 288	0.037 288
DCP 11	-1.10			2.666 346	0.897 48	0.337 250	0.337 250	0.060 44	0.031 302	0.031 302	0.031 302	0.031 302	0.031 302
DCP 12	-1.20			2.683 346	0.990 48	0.386 250	0.386 250	0.084 48	0.014 307	0.014 307	0.014 307	0.014 307	0.014 307
DCP 13	-1.30			2.699 346	1.083 48	0.435 250	0.435 250	0.014 190	0.003 21	0.003 21	0.003 21	0.003 21	0.003 21
DCP 14	-1.40			2.716 346	1.176 48	0.484 250	0.484 250	0.011 180	0.003 3	0.003 3	0.003 3	0.003 3	0.003 3
DCP 15	-1.50			2.733 346	1.269 48	0.533 250	0.533 250	0.008 165	0.002 76	0.002 76	0.002 76	0.002 76	0.002 76
DCP 16	-1.60			2.750 346	1.362 48	0.582 250	0.582 250	0.005 168	0.003 45	0.003 45	0.003 45	0.003 45	0.003 45
DCP 17	-1.70			2.767 346	1.455 48	0.631 250	0.631 250	0.005 172	0.003 91	0.003 91	0.003 91	0.003 91	0.003 91

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL		NLR 1		CYCLES ANALYSED			
		DRIVE MZ		K		MACH NO		DEL ALPHA		TEST POINT		EXT DAMP	
		TUNED MZ	Q	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA		0.0		0.016	0.084	0	0.082 349	0.153 344	0.118 153	0.034 326	0.054 98	0.024 132	0.021 229
CM		0.130		0.687 350	0.024 332	0.008 103	0.009 139	0.005 339	0.001 123	0.001 142	0.001 240	0.003 189	0.002 183
CM		-0.022		0.032 332	0.005 60	0.001 54	0.001 324	0.002 113	0.001 142	0.001 142	0.001 240	0.001 357	0.000 67
DCP 1	-0.10			2.496 345	0.180 264	0.071 339	0.259 319	0.029 7	0.108 292	0.031 1	0.035 240	0.034 316	0.008 244
DCP 2	-0.20			2.513 348	0.071 339	0.071 339	0.259 319	0.071 339	0.071 339	0.071 339	0.071 339	0.071 339	0.071 339
DCP 3	-0.30			2.530 347	0.152 37	0.223 332	0.223 332	0.112 31	0.035 341	0.035 341	0.035 341	0.035 341	0.035 341
DCP 4	-0.40			2.547 347	0.245 48	0.156 332	0.156 332	0.120 31	0.049 85	0.049 85	0.049 85	0.049 85	0.049 85
DCP 5	-0.50			2.564 346	0.339 49	0.086 330	0.086 330	0.104 24	0.100 86	0.100 86	0.100 86	0.100 86	0.100 86
DCP 6	-0.60			2.581 346	0.432 48	0.036 33	0.036 33	0.023 22	0.079 76	0.079 76	0.079 76	0.079 76	0.079 76
DCP 7	-0.70			2.598 346	0.525 48	0.132 111	0.132 111	0.171 200	0.028 93	0.028 93	0.028 93	0.028 93	0.028 93
DCP 8	-0.80			2.615 346	0.618 48	0.094 265	0.094 265	0.192 207	0.032 200	0.032 200	0.032 200	0.032 200	0.032 200
DCP 9	-0.90			2.632 346	0.711 48	0.239 267	0.239 267	0.077 197	0.035 152	0.035 152	0.035 152	0.035 152	0.035 152
DCP 10	-1.00			2.649 346	0.804 48	0.288 250	0.288 250	0.105 47	0.037 288	0.037 288	0.037 288	0.037 288	0.037 288
DCP 11	-1.10			2.666 346	0.897 48	0.337 250	0.337 250	0.060 44	0.031 302	0.031 302	0.031 302	0.031 302	0.031 302
DCP 12	-1.20			2.683 346	0.990 48	0.386 250	0.386 250	0.084 48	0.014 307	0.014 307	0.014 307	0.014 307	0.014 307
DCP 13	-1.30			2.699 346	1.083 48	0.435 250	0.435 250	0.014 190	0.003 21	0.003 21	0.003 21	0.003 21	0.003 21
DCP 14	-1.40			2.716 346	1.176 48	0.484 250	0.484 250	0.011 180	0.003 3	0.003 3	0.003 3	0.003 3	0.003 3
DCP 15	-1.50			2.733 346	1.269 48	0.533 250	0.533 250	0.008 165	0.002 76	0.002 76	0.002 76	0.002 76	0.002 76
DCP 16	-1.60			2.750 346	1.362 48	0.582 250	0.582 250	0.005 168	0.003 45	0.003 45	0.003 45	0.003 45	0.003 45
DCP 17	-1.70			2.767 346	1.455 48	0.631 250	0.631 250	0.005 172	0.003 91	0.003 91	0.003 91	0.003 91	0.003 91

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1	CYCLES ANALYSED																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		TUNED MZ					DRIVE MZ					MACH NO		DEL ALPHA			DEL M		ALPHA-0		TEST POINT		CYCLES ANALYSED																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		23.03					0.051					0.704		4.90			0.0		9.84		12077.2		20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
		Q					PN					CHIMINJ		CHINAXI			ALPHA-NMAX		AERO DAMP		TOR		EXT DAMP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
V		228.7 (750.4)	129703. (2708.9)	0.10E 08	0.076	0.051	0.704	4.90	0.0	9.84	12077.2	20																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1				CYCLES ANALYSED			
		TUNED MZ		DRIVE MZ		K		MACH NO		DEL ALPHA		DEL M		ALPHA-O		TEST POINT		CYCLES ANALYSED					
		0.0	228.7 (750.5)	23.05	Q	0.051	0.10E 08	0.705	CHIMINX	4.90	CHIMAX	0.0	10.13	12.49	12077.3	20							
V		228.7 (750.5)	129636. (2707.5)	0.051	0.10E 08	0.705	CHIMINX	4.90	CHIMAX	1.147	ALPHA-MAX	10.13	ALPHA-O	12.49	12077.3	20							
HARMONIC ANALYSIS																							
	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16						
0.010	0.467	1	0.116	78	0.028	127	0.019	134	0.010	133	0.016	59	0.008	204	0.012	111	0.006	351					
0.020	2.607	0.496	2	0.152	80	0.034	131	0.021	178	0.011	191	0.006	41	0.006	148	0.012	148	0.007	41				
0.030	2.424	0.361	1	0.161	86	0.073	129	0.004	50	0.018	143	0.015	8	0.016	144	0.010	36	0.005	204				
0.040	2.381	0.220	9	0.254	80	0.034	51	0.026	73	0.012	346	0.013	65	0.009	3	0.002	342	0.008	287				
0.074	2.276	0.100	21	0.184	82	0.055	150	0.043	102	0.029	130	0.024	77	0.015	99	0.008	49	0.005	116				
0.074	2.240	0.071	117	0.160	79	0.075	154	0.018	151	0.051	144	0.006	87	0.023	143	0.003	162	0.014	142				
0.140	2.048	0.160	133	0.066	345	0.069	153	0.049	216	0.027	154	0.021	193	0.004	225	0.014	234	0.009	286				
0.200	1.753	0.270	191	0.113	237	0.050	137	0.064	234	0.012	279	0.017	235	0.020	322	0.006	251	0.007	248				
0.250	1.471	0.147	95	0.073	237	0.011	96	0.008	343	0.023	79	0.006	22	0.005	298	0.017	361	0.001	183				
0.300	1.232	0.148	64	0.026	264	0.023	96	0.024	249	0.010	102	0.012	298	0.003	108	0.011	297	0.004	173				
0.399	1.048	0.194	54	0.023	32	0.015	37	0.003	24	0.003	7	0.011	279	0.008	53	0.013	307	0.003	77				
0.501	0.895	0.226	42	0.024	72	0.009	50	0.005	262	0.004	320	0.001	185	0.002	43	0.009	287	0.010	97				
0.600	0.855	0.248	29	0.038	76	0.009	29	0.008	108	0.006	294	0.007	193	0.004	69	0.009	164	0.006	74				
0.701	0.574	0.259	18	0.038	79	0.001	107	0.007	164	0.006	312	0.002	166	0.002	8	0.010	146	0.006	42				
0.800	0.596	0.256	10	0.036	79	0.004	231	0.016	130	0.003	330	0.006	82	0.004	278	0.004	132	0.009	1				
0.900	0.066	0.176	9	0.019	54	0.003	254	0.009	209	0.004	336	0.005	103	0.003	308	0.004	97	0.006	292				
0.969	-0.047	0.039	27	0.009	22	0.004	3	0.003	259	0.005	331	0.004	42	0.002	266	0.003	340	0.006	56				

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR 241

FORCED PITCHING OSCILLATION									
AIRFOIL					NLR 1				
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-O	TEST POINT	CYCLES ANALYSED	
0.0	23.03	0.117	0.295	7.66	0.0	7.34	12155.4	20	
V	Q	RM	CRIMINI	CHMAXI	ALPHA-MAX	AERO DAMP	TOR	EXT DAMP	
100.3	26468.	0.40E 07	-0.106	1.470	15.17	-0.00060	0.647	0.0	
(329.0)	(552.8)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
TYPE									
ALPHA	7.336	7.654	0	0.131 305	0.009 104	0.043 15	0.040 318	0.011 106	0.028 243
CM	0.752	0.605 10	0.138 349	0.046 192	0.032 52	0.022 313	0.016 220	0.021 100	0.014 334
CM	-0.014	0.021 265	0.022 62	0.023 308	0.016 193	0.004 96	0.006 353	0.007 233	0.007 115
DCP 1	0.010	2.917 359	1.285 37	0.731 321	0.477 237	0.284 160	0.187 95	0.168 18	0.068 295
DCP 2	0.020	2.505	1.041 39	0.599 422	0.415 234	0.287 148	0.177 71	0.131 3	0.045 290
DCP 3	0.030	2.330	1.894	0.567 312	0.354 221	0.203 132	0.077 63	0.072 40	0.041 256
DCP 4	0.040	2.358	2.047 0	0.444 12	0.074 190	0.054 87	0.037 340	0.026 278	0.042 345
DCP 5	0.074	2.033	1.616 2	0.400 13	0.053 179	0.047 70	0.037 319	0.018 222	0.027 162
DCP 6	0.094	1.832	1.335 4	0.355 12	0.075 142	0.051 51	0.041 297	0.024 264	0.024 114
DCP 7	0.149	1.354	1.033 6	0.259 2	0.075 130	0.051 19	0.035 285	0.020 147	0.029 107
DCP 8	0.200	1.159	0.921 9	0.237 347	0.098 100	0.071 357	0.049 254	0.032 145	0.020 72
DCP 9	0.250	1.030	0.848 9	0.242 328	0.121 76	0.080 137	0.053 254	0.032 157	0.024 70
DCP 10	0.300	0.932	0.785 9	0.219 316	0.127 70	0.093 135	0.055 240	0.032 172	0.016 95
DCP 11	0.349	0.872	0.730 14	0.187 311	0.112 64	0.093 125	0.049 218	0.031 72	0.029 72
DCP 12	0.381	0.817	0.679 17	0.160 312	0.086 35	0.097 109	0.041 212	0.049 110	0.031 34
DCP 13	0.458	0.751	0.631 22	0.093 319	0.086 13	0.097 171	0.039 172	0.048 42	0.031 344
DCP 14	0.701	0.506	0.431 31	0.048 317	0.084 350	0.082 137	0.032 137	0.040 48	0.041 320
DCP 15	0.800	0.236	0.174 24	0.048 280	0.084 346	0.082 134	0.016 175	0.024 49	0.048 300
DCP 16	0.900	-0.014	0.091 12	0.041 227	0.033 328	0.011 249	0.016 116	0.022 22	0.028 279
DCP 17	0.959	-0.030	0.027 1	0.026 229	0.004 249	0.013 285	0.017 152	0.022 24	0.028 291

FORCED PITCHING OSCILLATION									
AIRFOIL					NLR 1				
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-O	TEST POINT	CYCLES ANALYSED	
0.0	23.08	0.117	0.295	7.61	0.0	9.96	12155.5	20	
V	Q	RM	CRIMINI	CHMAXI	ALPHA-MAX	AERO DAMP	TOR	EXT DAMP	
100.1	26420.	0.40E 07	-0.106	1.764	17.50	-0.00063	0.676	0.0	
(338.4)	(551.8)								
HARMONIC ANALYSIS									
DATA	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
TYPE									
ALPHA	9.950	7.808 0	0.405 2	0.126 324	0.044 314	0.049 221	0.074 59	0.026 298	0.044 235
CM	0.820	0.501 26	0.228 8	0.082 274	0.055 189	0.041 184	0.027 28	0.022 320	0.029 270
CM	-0.024	0.047 211	0.044 89	0.027 1	0.016 303	0.015 230	0.009 147	0.006 112	0.007 59
DCP 1	0.010	2.492	1.037 14	0.556 0	0.319 319	0.243 283	0.122 267	0.183 239	0.157 186
DCP 2	0.020	2.936	1.061 18	0.467 62	0.400 305	0.161 266	0.075 231	0.125 234	0.118 181
DCP 3	0.030	2.687	0.828 21	1.383 62	0.590 350	0.139 297	0.135 267	0.156 219	0.111 161
DCP 4	0.040	2.731	1.253 13	0.798 46	0.353 345	0.202 285	0.116 167	0.073 80	0.098 18
DCP 5	0.074	2.326	1.002 18	0.691 40	0.283 327	0.137 258	0.093 197	0.046 42	0.029 339
DCP 6	0.094	2.044	0.873 24	0.633 33	0.140 257	0.072 171	0.074 100	0.047 23	0.031 318
DCP 7	0.149	1.593	0.811 26	0.526 17	0.231 284	0.113 209	0.071 103	0.036 24	0.027 34
DCP 8	0.200	1.342	0.738 29	0.445 14	0.221 287	0.151 219	0.107 81	0.063 10	0.021 314
DCP 9	0.250	1.170	0.732 27	0.381 359	0.192 270	0.110 130	0.079 94	0.036 332	0.033 317
DCP 10	0.300	1.055	0.668 26	0.342 351	0.175 260	0.112 122	0.077 45	0.044 344	0.033 317
DCP 11	0.399	0.885	0.592 30	0.276 344	0.145 251	0.100 112	0.058 37	0.039 359	0.035 301
DCP 12	0.501	0.675	0.499 29	0.211 332	0.112 229	0.093 163	0.055 359	0.035 317	0.041 197
DCP 13	0.600	0.559	0.408 30	0.170 317	0.093 163	0.081 59	0.059 342	0.036 297	0.043 238
DCP 14	0.701	0.489	0.301 35	0.129 299	0.085 114	0.064 39	0.047 312	0.026 78	0.041 209
DCP 15	0.800	0.242 24	0.118 275	0.085 186	0.065 117	0.047 26	0.024 312	0.021 260	0.023 195
DCP 16	0.900	0.033 9	0.078 261	0.037 163	0.041 108	0.037 10	0.021 2	0.007 256	0.028 87
DCP 17	0.959	-0.016	0.043 11	0.044 264	0.016 137	0.013 6	0.007 1	0.013 34	0.017 145

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 22.97	K 0.088	MACH NO 0.394	DEL ALPHA 7.83	DEL M 0.0	ALPHA-O 7.46	ALPHA-MAX 14.49	TEST POINT 12157.4	EXT DAMP 0.0	EXT DAMP 0.0	EXT DAMP 0.0
ALP A		7.457	7.834	0	0.577	2	0.110	330	0.049	301	0.057	148	0.007
CN		0.706	0.468	13	0.201	28	0.065	303	0.021	270	0.018	70	0.005
CM		-0.011	0.028	237	0.023	116	0.019	15	0.008	306	0.005	221	0.002
DCP 1	-010	3.033	2.653	347	1.172	76	0.679	25	0.302	342	0.149	276	0.003
DCP 2	-020	2.462	2.100	356	0.934	60	0.381	16	0.225	345	0.060	256	0.066
DCP 3	-030	2.276	1.688	354	0.875	69	0.462	74	0.312	336	0.135	224	0.059
DCP 4	-049	2.141	1.413	0	0.815	55	0.381	351	0.169	291	0.022	178	0.023
DCP 5	-074	2.191	0.583	22	0.297	47	0.469	323	0.269	277	0.254	308	0.190
DCP 6	-099	1.674	0.918	6	0.618	47	0.261	333	0.095	268	0.031	200	0.015
DCP 7	-149	1.283	0.799	11	0.468	33	0.203	311	0.041	229	0.039	169	0.021
DCP 8	-200	1.076	0.721	13	0.363	31	0.135	309	0.043	237	0.045	158	0.015
DCP 9	-250	0.948	0.679	13	0.309	18	0.119	286	0.043	198	0.045	125	0.023
DCP 10	-300	0.843	0.591	14	0.263	12	0.105	276	0.041	226	0.047	110	0.032
DCP 11	-399	0.704	0.517	18	0.206	8	0.083	259	0.029	207	0.039	99	0.024
DCP 12	-501	0.533	0.408	21	0.154	2	0.059	243	0.016	179	0.029	52	0.013
DCP 13	-600	0.425	0.307	27	0.124	1	0.052	228	0.014	110	0.019	133	0.021
DCP 14	-701	0.368	0.197	36	0.099	358	0.051	204	0.025	88	0.011	125	0.024
DCP 15	-800	0.219	0.167	32	0.070	326	0.033	191	0.020	101	0.018	100	0.016
DCP 16	-900	-0.015	0.117	19	0.057	289	0.031	196	0.015	151	0.021	97	0.011
DCP 17	-969	-0.039	0.039	13	0.038	279	0.013	211	0.009	177	0.009	128	0.003

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 22.64	K 0.087	MACH NO 0.394	DEL ALPHA 7.75	DEL M 0.0	ALPHA-O 9.97	ALPHA-MAX 15.60	TEST POINT 12157.5	EXT DAMP 0.0	EXT DAMP 0.0	EXT DAMP 0.0
ALP A		7.457	7.834	0	0.577	2	0.110	330	0.049	301	0.057	148	0.007
CN		0.706	0.468	13	0.201	28	0.065	303	0.021	270	0.018	70	0.005
CM		-0.011	0.028	237	0.023	116	0.019	15	0.008	306	0.005	221	0.002
DCP 1	-010	3.033	2.653	347	1.172	76	0.679	25	0.302	342	0.149	276	0.003
DCP 2	-020	2.462	2.100	356	0.934	60	0.381	16	0.225	345	0.060	256	0.066
DCP 3	-030	2.276	1.688	354	0.875	69	0.462	74	0.312	336	0.135	224	0.059
DCP 4	-049	2.141	1.413	0	0.815	55	0.381	351	0.169	291	0.022	178	0.023
DCP 5	-074	2.191	0.583	22	0.297	47	0.469	323	0.269	277	0.254	308	0.190
DCP 6	-099	1.674	0.918	6	0.618	47	0.261	333	0.095	268	0.031	200	0.015
DCP 7	-149	1.283	0.799	11	0.468	33	0.203	311	0.041	229	0.039	169	0.021
DCP 8	-200	1.076	0.721	13	0.363	31	0.135	309	0.043	237	0.045	158	0.015
DCP 9	-250	0.948	0.679	13	0.309	18	0.119	286	0.043	198	0.045	125	0.023
DCP 10	-300	0.843	0.591	14	0.263	12	0.105	276	0.041	226	0.047	110	0.032
DCP 11	-399	0.704	0.517	18	0.206	8	0.083	259	0.029	207	0.039	99	0.024
DCP 12	-501	0.533	0.408	21	0.154	2	0.059	243	0.016	179	0.029	52	0.013
DCP 13	-600	0.425	0.307	27	0.124	1	0.052	228	0.014	110	0.019	133	0.021
DCP 14	-701	0.368	0.197	36	0.099	358	0.051	204	0.025	88	0.011	125	0.024
DCP 15	-800	0.219	0.167	32	0.070	326	0.033	191	0.020	101	0.018	100	0.016
DCP 16	-900	-0.015	0.117	19	0.057	289	0.031	196	0.015	151	0.021	97	0.011
DCP 17	-969	-0.039	0.039	13	0.038	279	0.013	211	0.009	177	0.009	128	0.003

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL		CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 45.05	K 0.173	MACH NO 0.394	DEL. ALPHA 8.41	DEL. M 0.0	ALPHA.0 4.99	TEST POINT 12159.3	TOR 0.052	EXT DAMP 0.0
ALPHA											
CM											
CM											
DCP 1	-010	2.066	3.740 348	0.911 35	0.681 328	0.225 229	0.270 160	0.028 6	0.096 132	0.119 42	0.000 302
DCP 2	-020	1.778	3.054 355	0.666 24	0.398 317	0.264 225	0.171 158	0.105 95	0.097 46	0.068 351	0.000 296
DCP 3	-030	1.814	2.720 354	0.502 13	0.286 307	0.199 213	0.154 137	0.118 59	0.095 356	0.078 288	0.000 217
DCP 4	-049	1.714	2.216 356	0.448 9	0.228 293	0.126 181	0.051 82	0.009 324	0.034 57	0.057 325	0.000 236
DCP 5	-074	1.742	1.561 356	0.597 314	0.411 365	0.118 111	0.241 188	0.236 285	0.111 19	0.043 108	0.000 200
DCP 6	-099	1.442	1.565 359	0.323 356	0.127 251	0.092 131	0.244 114	0.008 274	0.035 7	0.061 248	0.000 178
DCP 7	-149	1.093	1.234 1	0.241 338	0.098 213	0.084 98	0.046 336	0.013 253	0.025 298	0.038 216	0.000 129
DCP 8	-203	0.891	1.025 6	0.183 328	0.075 197	0.070 79	0.037 281	0.002 182	0.023 304	0.038 216	0.000 119
DCP 9	-250	0.778	0.895 4	0.146 328	0.078 162	0.068 26	0.037 259	0.003 173	0.009 173	0.017 90	0.000 67
DCP10	-300	0.666	0.759 6	0.114 326	0.065 146	0.066 12	0.030 259	0.003 182	0.007 135	0.002 132	0.000 323
DCP11	-399	0.560	0.608 16	0.085 335	0.052 145	0.071 9	0.034 273	0.003 193	0.007 135	0.002 132	0.000 260
DCP12	-501	0.407	0.464 23	0.070 343	0.051 136	0.063 353	0.026 227	0.013 91	0.007 135	0.002 132	0.000 304
DCP13	-501	0.323	0.347 33	0.060 359	0.037 137	0.065 345	0.023 219	0.010 98	0.005 106	0.009 339	0.000 245
DCP14	-701	0.310	0.244 48	0.065 3	0.028 128	0.057 332	0.023 204	0.012 54	0.007 55	0.010 297	0.000 195
DCP15	-800	0.153	0.168 53	0.030 339	0.037 117	0.059 332	0.020 202	0.009 58	0.008 55	0.012 283	0.000 177
DCP16	-900	-0.067	0.077 48	0.023 283	0.032 75	0.044 307	0.010 103	0.003 324	0.008 5	0.006 231	0.000 120
DCP17	-969	-0.058	0.018 117	0.019 283	0.012 100	0.038 333	0.008 146	0.005 343	0.006 79	0.010 292	0.000 185

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL		CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 45.11	K 0.174	MACH NO 0.392	DEL. ALPHA 8.30	DEL. M 0.0	ALPHA.0 7.49	TEST POINT 12159.4	TOR 0.750	EXT DAMP 0.0
ALPHA											
CM											
CM											
DCP 1	-010	2.750	2.610 354	1.120 57	0.727 0	0.400 290	0.121 287	0.158 267	0.112 215	0.072 185	0.000 184
DCP 2	-020	2.227	2.060 4	1.005 51	0.521 353	0.288 300	0.149 280	0.137 242	0.104 201	0.114 172	0.000 130
DCP 3	-030	2.034	1.621 8	1.028 49	0.558 341	0.289 275	0.092 245	0.105 236	0.125 181	0.119 129	0.000 72
DCP 4	-049	2.089	1.667 9	0.732 30	0.313 314	0.087 257	0.061 299	0.090 211	0.058 117	0.006 284	0.000 178
DCP 5	-074	2.108	0.889 15	0.743 348	0.411 357	0.315 168	0.314 264	0.208 15	0.252 106	0.154 222	0.000 31
DCP 6	-099	1.708	1.243 15	0.541 14	0.210 288	0.052 233	0.040 232	0.071 167	0.050 75	0.013 228	0.000 86
DCP 7	-149	1.330	1.066 17	0.418 356	0.174 268	0.060 214	0.056 181	0.068 95	0.048 17	0.012 218	0.000 19
DCP 8	-200	1.109	0.977 22	0.374 354	0.165 260	0.068 207	0.064 157	0.069 93	0.042 23	0.011 313	0.000 344
DCP 9	-250	0.976	0.897 20	0.317 336	0.136 226	0.069 174	0.062 110	0.067 31	0.044 306	0.026 239	0.000 267
DCP10	-300	0.875	0.802 21	0.272 328	0.127 211	0.073 151	0.074 79	0.061 351	0.028 265	0.023 256	0.000 203
DCP11	-399	0.743	0.711 27	0.222 323	0.115 203	0.069 155	0.081 70	0.066 343	0.036 271	0.031 260	0.000 179
DCP12	-501	0.565	0.579 29	0.169 305	0.112 173	0.060 107	0.075 26	0.061 294	0.034 239	0.044 193	0.000 93
DCP13	-600	0.458	0.471 34	0.146 293	0.118 156	0.055 84	0.071 359	0.094 263	0.027 215	0.039 166	0.000 59
DCP14	-701	0.345	0.345 39	0.121 275	0.114 135	0.051 41	0.056 328	0.042 227	0.020 189	0.037 129	0.000 20
DCP15	-800	0.238	0.252 34	0.108 250	0.103 120	0.041 26	0.047 310	0.030 212	0.021 186	0.033 94	0.000 344
DCP16	-900	-0.012	0.145 24	0.089 243	0.059 124	0.018 24	0.045 294	0.027 187	0.018 150	0.026 48	0.000 300
DCP17	-969	-0.042	0.037 21	0.048 257	0.021 144	0.007 104	0.025 305	0.020 188	0.004 203	0.014 51	0.000 344

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL				NLR 1		CYCLES ANALYSED			
		TUNED MZ 0.0	DRIVE MZ 22.03	K 0.068	MACH NO 0.493	DEL-ALPHA 7.91	DEL-H 0.0	ALPHA-0 2.46	ALPHA-MAX 10.46	AERO DAMP -0.00088	EXT DAMP 0.0	TEST POINT 12161.2	RES 7 PMI	RES 6 PMI	RES 5 PMI	RES 4 PMI	RES 3 PMI	RES 2 PMI	RES 1 PMI		
ALPHA CM		Q 165.3 (542.4)	73305. (7331.0)	RN 0.80E 07	CHIMINJ -0.035	CHIMAXJ 1.155															
CM		HARMONIC ANALYSIS																			
DCP 1	-010	0.911	4.839 350	0.403 11	0.328 322	0.193 317	0.231 114	0.072 149	0.054 232	0.010 593	0.035 219										
DCP 2	-020	0.149	4.169 353	0.380 333	0.145 304	0.133 281	0.097 168	0.071 82	0.048 275	0.024 312	0.044 4										
DCP 3	-030	0.160	3.778 353	0.391 331	0.089 209	0.098 248	0.076 229	0.073 67	0.044 346	0.022 275	0.044 353										
DCP 4	-040	1.199	3.054 353	0.365 354	0.104 291	0.193 232	0.116 199	0.127 59	0.120 359	0.086 244	0.044 146										
DCP 5	-050	1.290	1.818 356	0.298 295	0.421 302	0.037 83	0.072 85	0.122 330	0.068 51	0.083 137	0.095 207										
DCP 6	-060	0.971	1.872 353	0.244 15	0.097 295	0.065 188	0.036 31	0.074 336	0.026 266	0.024 183	0.015 173										
DCP 7	-070	0.713	1.364 354	0.156 7	0.066 292	0.013 163	0.029 21	0.030 297	0.015 216	0.005 196	0.003 207										
DCP 8	-080	0.597	1.168 357	0.130 351	0.055 251	0.035 101	0.045 11	0.036 286	0.024 205	0.006 94	0.005 31										
DCP 9	-090	0.532	1.028 356	0.108 340	0.046 218	0.051 77	0.095 368	0.041 264	0.029 172	0.019 58	0.016 334										
DCP 10	-100	0.465	0.839 356	0.094 353	0.034 239	0.030 83	0.039 344	0.026 261	0.016 159	0.012 34	0.006 317										
DCP 11	-110	0.371	0.641 0	0.099 16	0.030 288	0.007 100	0.020 351	0.012 299	0.007 165	0.009 6	0.006 253										
DCP 12	-120	0.277	0.472 2	0.068 26	0.031 297	0.002 123	0.012 353	0.007 247	0.007 167	0.008 8	0.003 286										
DCP 13	-130	0.236	0.335 6	0.065 38	0.039 301	0.008 207	0.009 36	0.005 292	0.006 186	0.005 331	0.002 305										
DCP 14	-140	0.266	0.199 10	0.068 50	0.038 306	0.011 211	0.009 19	0.003 283	0.002 174	0.008 352	0.003 286										
DCP 15	-150	0.116	0.107 20	0.041 54	0.028 296	0.005 201	0.011 9	0.004 266	0.003 159	0.006 354	0.002 251										
DCP 16	-160	-0.082	0.036 46	0.010 261	0.015 241	0.007 25	0.009 336	0.004 204	0.006 23	0.005 3	0.003 107										
DCP 17	-169	-0.054	0.026 170	0.017 245	0.008 200	0.004 84	0.006 296	0.002 197	0.001 140	0.003 33	0.001 17										

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				NLR 1				CYCLES ANALYSED						
		TUNED HZ 0.0	DRIVE HZ 22.71	K 0.070	MACH NO 0.492	DEL-ALPHA 7.86	DEL-H 0.0	ALPHA-0 4.85	TEST POINT 12161.3	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI		
ALPHA CN CM	V	Q 164.9 (540.9)	73041.5 (1525.5)	RN 0.80E 07	CM(1IN) -0.064	CN(MAX) 1.250	ALPHA-NMAX 11.97	AERO DAMP -0.00091	TOR 1.193	EST DAMP 0.0	HARMONIC ANALYSIS									
											RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI	RES 9 PMI	
DCP 1	-010	1.820	3.686	337	1.097	63	0.640	358	0.323	280	0.157	234	0.092	178	0.021	178	0.018	9	0.024	319
DCP 2	-020	1.783	3.171	331	0.763	67	0.639	47	0.396	287	0.166	228	0.100	198	0.048	141	0.022	41	0.028	62
DCP 3	-030	1.851	2.868	331	0.530	64	0.497	9	0.352	296	0.175	232	0.101	199	0.072	144	0.031	60	0.037	86
DCP 4	-040	1.674	2.089	352	0.681	65	0.531	1	0.332	291	0.153	224	0.038	213	0.071	191	0.056	85	0.066	47
DCP 5	-074	1.818	0.891	3	0.120	342	0.784	328	0.267	359	0.114	166	0.083	171	0.079	88	0.098	162	0.069	740
DCP 6	-099	1.330	1.342	356	0.519	49	0.278	333	0.127	261	0.084	282	0.040	135	0.020	66	0.027	19	0.021	447
DCP 7	-149	1.014	1.080	359	0.358	35	0.197	313	0.100	230	0.032	162	0.035	104	0.026	32	0.038	349	0.019	284
DCP 8	-200	0.836	0.926	2	0.286	31	0.151	303	0.077	218	0.040	154	0.039	104	0.027	46	0.038	355	0.021	285
DCP 9	-250	0.750	0.839	2	0.253	19	0.160	284	0.090	193	0.059	122	0.046	68	0.046	10	0.030	395	0.031	282
DCP10	-300	0.694	0.701	2	0.211	17	0.109	277	0.083	152	0.038	105	0.033	74	0.039	8	0.026	583	0.022	225
DCP11	-359	0.591	0.550	7	0.170	24	0.081	280	0.050	113	0.038	87	0.013	46	0.023	8	0.022	330	0.018	212
DCP12	-401	0.401	0.413	10	0.136	23	0.063	269	0.038	151	0.023	49	0.007	341	0.012	356	0.020	224	0.012	181
DCP13	-600	0.325	0.298	13	0.114	25	0.051	264	0.035	139	0.021	50	0.007	327	0.011	343	0.025	210	0.013	150
DCP14	-701	0.323	0.174	24	0.094	30	0.040	256	0.031	119	0.019	16	0.009	299	0.007	303	0.021	201	0.009	125
DCP15	-800	0.159	0.128	26	0.092	5	0.036	221	0.031	101	0.016	9	0.006	316	0.009	309	0.022	189	0.007	166
DCP16	-900	-0.058	0.082	19	0.047	298	0.040	197	0.022	94	0.010	32	0.011	348	0.011	289	0.020	174	0.004	51
DCP17	-969	-0.054	0.009	57	0.034	279	0.022	202	0.009	132	0.007	69	0.008	3	0.007	284	0.018	185	0.003	187

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL NLR 1										CYCLES ANALYSED									
		TUNED MZ	DRIVE MZ	K	WACH NO	DEL ALPHA	DEL M	ALPHA-0	ALPHA-MAX	AERO DAMP	EXT DAMP																				
ALPHA		0.0	45.09	0.139	0.493	8.44	0.0	2.30																							
CN		0.363	0.709 357	0.006 356	0.009 266	0.071 22	0.010 259	0.005 56																							
CM		-0.005	0.040 303	0.006 255	0.003 48	0.008 226	0.001 57	0.001 283																							
DCP 1	-010	0.724	4.587 343	0.303 338	0.212 300	0.071 287	0.104 13	0.013 105																							
DCP 2	-020	1.066	3.969 349	0.313 309	0.028 278	0.071 269	0.022 123	0.028 344																							
DCP 3	-030	1.103	3.563 348	0.284 307	0.069 136	0.041 228	0.024 163	0.036 330																							
DCP 4	-040	1.226	3.004 349	0.283 317	0.053 171	0.029 180	0.029 164	0.032 327																							
DCP 5	-074	1.225	1.945 349	0.337 315	0.018 170	0.089 185	0.124 298	0.060 346																							
DCP 6	-099	0.951	1.767 351	0.187 357	0.061 276	0.017 96	0.022 258	0.034 247																							
DCP 7	-149	0.674	1.263 352	0.115 7	0.043 304	0.030 294	0.026 230	0.003 340																							
DCP 8	-200	0.572	1.049 357	0.062 344	0.021 74	0.058 334	0.026 216	0.018 105																							
DCP 9	-250	0.498	0.974 354	0.053 358	0.031 60	0.069 349	0.050 220	0.044 99																							
DCP10	-300	0.444	0.794 354	0.070 8	0.010 23	0.035 354	0.020 220	0.019 72																							
DCP11	-399	0.363	0.622 6	0.072 23	0.009 328	0.034 42	0.009 256	0.008 101																							
DCP12	-501	0.271	0.468 11	0.058 29	0.013 263	0.026 41	0.007 286	0.002 67																							
DCP13	-600	0.231	0.347 17	0.054 30	0.016 254	0.029 55	0.007 285	0.001 84																							
DCP14	-701	0.199	0.222 27	0.056 38	0.017 258	0.025 52	0.007 286	0.002 113																							
DCP15	-800	0.119	0.134 43	0.037 44	0.016 240	0.025 52	0.006 250	0.003 113																							
DCP16	-900	-0.087	0.058 71	0.009 259	0.014 198	0.035 35	0.009 221	0.004 10																							
DCP17	-969	-0.055	0.039 169	0.008 250	0.010 177	0.035 38	0.006 165	0.004 326																							

HARMONIC ANALYSIS

DATA TYPE	X/C	FORCED PITCHING OSCILLATION										AIRFOIL NLR 1										CYCLES ANALYSED									
		TUNED MZ	DRIVE MZ	K	WACH NO	DEL ALPHA	DEL M	ALPHA-0	ALPHA-MAX	AERO DAMP	EXT DAMP																				
ALPHA		0.0	45.10	0.139	0.491	8.34	0.0	4.93																							
CN		0.321	0.629 10	0.021 80	0.052 326	0.017 84	0.021 329	0.011 287																							
CM		-0.010	0.033 261	0.021 80	0.026 327	0.021 202	0.006 124	0.004 61																							
DCP 1	-010	1.496	3.459 348	1.023 38	0.635 334	0.354 223	0.130 134	0.064 289																							
DCP 2	-020	1.503	2.889 355	0.803 35	0.553 337	0.348 249	0.153 164	0.037 323																							
DCP 3	-030	1.529	2.480 356	0.712 27	0.445 328	0.251 253	0.147 191	0.056 127																							
DCP 4	-040	1.493	1.939 359	0.744 30	0.452 319	0.188 235	0.056 223	0.080 204																							
DCP 5	-074	1.661	1.165 5	0.521 1	0.351 306	0.301 226	0.207 308	0.119 33																							
DCP 6	-099	1.281	1.383 3	0.520 17	0.256 293	0.128 185	0.034 81	0.004 258																							
DCP 7	-149	0.993	1.158 5	0.384 356	0.185 260	0.120 154	0.041 51	0.018 28																							
DCP 8	-200	0.826	1.014 11	0.324 353	0.153 250	0.105 150	0.038 55	0.021 27																							
DCP 9	-250	0.735	0.922 8	0.279 337	0.147 214	0.099 94	0.061 6	0.030 312																							
DCP10	-300	0.659	0.785 9	0.230 331	0.120 199	0.082 76	0.050 350	0.025 293																							
DCP11	-399	0.541	0.646 18	0.184 337	0.107 199	0.073 73	0.042 5	0.030 241																							
DCP12	-501	0.404	0.505 22	0.140 330	0.094 179	0.077 53	0.043 335	0.029 279																							
DCP13	-600	0.322	0.383 29	0.104 331	0.081 165	0.072 30	0.034 309	0.020 255																							
DCP14	-701	0.125	0.262 39	0.075 327	0.077 10	0.077 10	0.031 272	0.013 225																							
DCP15	-800	0.144	0.188 40	0.057 295	0.069 139	0.068 1	0.021 267	0.010 231																							
DCP16	-900	-0.058	0.101 29	0.061 257	0.050 133	0.064 350	0.015 280	0.016 208																							
DCP17	-969	-0.033	0.012 58	0.041 258	0.029 142	0.037 356	0.010 296	0.011 216																							

HARMONIC ANALYSIS

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.13	0.057	0.991	7.72	0.0	4.05	12167.3	20	0.0
AIRFOIL NLR 1									
DATA TYPE	Z/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		4.050	7.716 0	0.637 5	0.086 331	0.046 27	0.070 10	0.049 309	0.069 17
CM		0.674	0.761 3	0.267 38	0.079 359	0.054 348	0.043 283	0.018 266	0.006 86
CM		-0.028	0.045 244	0.026 128	0.006 104	0.011 101	0.005 49	0.004 11	0.002 59
HARMONIC ANALYSIS									
DATA TYPE	Z/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
DCP 1	-0.010	0.931	3.540 348	0.985 45	0.202 56	0.148 350	0.042 63	0.046 190	0.025 208
DCP 2	-0.020	0.966	3.188 351	0.862 45	0.224 77	0.103 330	0.040 251	0.049 240	0.039 186
DCP 3	-0.030	1.091	2.809 351	0.789 45	0.254 88	0.091 292	0.108 251	0.047 275	0.029 327
DCP 4	-0.040	1.413	2.376 351	0.756 45	0.194 94	0.078 255	0.117 254	0.041 324	0.018 138
DCP 5	-0.050	1.702	1.913 354	0.688 333	0.179 340	0.144 0	0.119 282	0.042 324	0.010 61
DCP 6	-0.060	2.043	1.472 352	0.644 52	0.153 6	0.124 347	0.101 27	0.042 191	0.008 113
DCP 7	-0.070	2.431	1.074 352	0.734 54	0.186 345	0.154 15	0.037 282	0.041 211	0.005 115
DCP 8	-0.080	2.868	0.741 355	0.790 60	0.217 340	0.234 39	0.111 386	0.041 332	0.004 88
DCP 9	-0.090	3.353	0.482 357	0.909 56	0.165 350	0.249 28	0.125 350	0.047 34	0.003 68
DCP 10	-0.100	3.888	0.241 357	1.035 50	0.189 11	0.132 15	0.125 350	0.047 34	0.003 258
DCP 11	-0.110	4.473	0.042 10	1.178 15	0.048 6	0.048 308	0.047 314	0.032 208	0.003 319
DCP 12	-0.120	5.106	0.492 22	1.166 24	0.040 354	0.071 299	0.032 248	0.023 237	0.015 209
DCP 13	-0.130	5.789	0.315 32	1.139 349	0.010 246	0.049 296	0.033 214	0.016 193	0.013 162
DCP 14	-0.140	6.522	0.263 29	1.123 328	0.028 250	0.040 286	0.032 209	0.016 164	0.007 149
DCP 15	-0.150	7.305	0.165 25	1.096 310	0.037 287	0.043 270	0.026 207	0.017 194	0.011 133
DCP 16	-0.160	8.138	0.022 92	0.039 295	0.012 297	0.019 291	0.011 214	0.004 176	0.002 87
DCP 17	-0.170	9.021							
FORCED PITCHING OSCILLATION NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-H	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.97	0.167	0.272	10.30	0.0	0.01	12171.1	20	0.0
AIRFOIL NLR 1									
DATA TYPE	Z/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		69.9	12411.0	0.029 22	0.315 204	0.046 104	0.002 290	0.024 167	0.007 335
CM		0.165	0.630 4	0.004 24	0.001 327	0.001 356	0.000 292	0.002 172	0.007 339
CM		-0.025	0.039 246	0.007 287	0.001 327	0.001 356	0.000 292	0.002 172	0.007 339
HARMONIC ANALYSIS									
DATA TYPE	Z/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
DCP 1	-0.010	0.931	3.540 348	0.985 45	0.202 56	0.148 350	0.042 63	0.046 190	0.025 208
DCP 2	-0.020	0.966	3.188 351	0.862 45	0.224 77	0.103 330	0.040 251	0.049 240	0.039 186
DCP 3	-0.030	1.091	2.809 351	0.789 45	0.254 88	0.091 292	0.108 251	0.047 275	0.029 327
DCP 4	-0.040	1.413	2.376 351	0.756 45	0.194 94	0.078 255	0.117 254	0.041 324	0.018 138
DCP 5	-0.050	1.702	1.913 354	0.688 333	0.179 340	0.144 0	0.119 282	0.042 324	0.010 61
DCP 6	-0.060	2.043	1.472 352	0.644 52	0.153 6	0.124 347	0.101 27	0.042 191	0.008 113
DCP 7	-0.070	2.431	1.074 352	0.734 54	0.186 345	0.154 15	0.037 282	0.041 211	0.005 115
DCP 8	-0.080	2.868	0.741 355	0.790 60	0.217 340	0.234 39	0.111 386	0.041 332	0.004 88
DCP 9	-0.090	3.353	0.482 357	0.909 56	0.165 350	0.249 28	0.125 350	0.047 34	0.003 68
DCP 10	-0.100	3.888	0.241 357	1.035 50	0.189 11	0.132 15	0.125 350	0.047 34	0.003 258
DCP 11	-0.110	4.473	0.042 10	1.178 15	0.048 6	0.048 308	0.047 314	0.032 208	0.015 209
DCP 12	-0.120	5.106	0.492 22	1.166 24	0.040 354	0.071 299	0.032 248	0.023 237	0.013 162
DCP 13	-0.130	5.789	0.315 32	1.139 349	0.010 246	0.049 296	0.033 214	0.016 193	0.007 149
DCP 14	-0.140	6.522	0.263 29	1.123 328	0.028 250	0.040 286	0.032 209	0.016 164	0.007 149
DCP 15	-0.150	7.305	0.165 25	1.096 310	0.037 287	0.043 270	0.026 207	0.017 194	0.011 133
DCP 16	-0.160	8.138	0.022 92	0.039 295	0.012 297	0.019 291	0.011 214	0.004 176	0.002 87
DCP 17	-0.170	9.021							

REPRODUCIBILITY OF THE
DATA IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ	DELTA MZ	K	MACH NO	DELTA ALPHA	DELTA M	ALPHA-0	ALPHA-0	TEST POINT	CYCLES ANALYSED
3.0	23.00	0.172	0.198	10.29	0.0	2.40	2.40	12171.2	20
V	Q	W	CHIMINI	CHIMINI	ALPHA-MAX	ALPHA-MAX	ALPHA-MAX	TEST POINT	CYCLES ANALYSED
58.2	11984.	0.325 37	-0.074	1.108	12.82	-0.00140	-0.00140	12171.2	20
(223.7)	(750.3)							FOR	EXT DAMP
								0.013	0.0
MARSHALL ANALYSIS									
DATA	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	10.208 0	0.958 355	0.154 328	0.031 12	0.010 249	0.000 152	0.000 152	0.016 160	0.022 150
CM	0.387 0	0.073 21	0.012 353	0.004 346	0.002 27	0.003 275	0.003 275	0.004 125	0.015 135
CM	-0.010	0.001 296	0.002 37	0.001 212	0.001 149	0.001 108	0.001 108	0.002 294	0.007 340
UCP 1	0.051	0.267 247	0.075 24	0.128 235	0.006 101	0.007 74	0.007 74	0.034 287	0.061 23
UCP 2	0.020	0.242 350	0.051 357	0.018 351	0.014 271	0.007 64	0.007 64	0.019 309	0.003 47
UCP 3	0.030	1.101 3637	0.286 351	0.012 324	0.007 291	0.003 103	0.003 103	0.011 313	0.034 42
UCP 4	0.049	0.927 2.951 351	0.274 349	0.009 339	0.011 358	0.001 14	0.001 14	0.006 255	0.035 55
UCP 5	0.074	0.912 2.389 351	0.191 346	0.007 315	0.009 351	0.006 233	0.006 233	0.012 287	0.029 44
UCP 6	0.099	1.005 1.946 353	0.163 32	0.007 337	0.009 359	0.002 164	0.002 164	0.036 337	0.032 28
UCP 7	0.149	0.704 1.518 355	0.132 5	0.006 240	0.003 142	0.005 116	0.005 116	0.002 3	0.020 53
UCP 8	0.209	0.629 1.210 359	0.108 16	0.002 182	0.004 113	0.014 266	0.014 266	0.015 286	0.034 42
UCP 9	0.250	0.512 1.074 359	0.082 17	0.001 351	0.003 6	0.003 147	0.003 147	0.009 155	0.015 168
UCP 10	0.300	0.419 0.846 359	0.064 26	0.011 43	0.007 236	0.003 235	0.003 235	0.009 145	0.016 130
UCP 11	0.349	0.349 0.735 359	0.044 42	0.013 352	0.007 236	0.003 235	0.003 235	0.009 145	0.016 130
UCP 12	0.400	0.288 0.547 359	0.037 37	0.006 4	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 13	0.450	0.240 0.412 359	0.031 41	0.002 133	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 14	0.500	0.200 0.288 359	0.025 52	0.003 336	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 15	0.550	0.160 0.172 359	0.020 63	0.003 132	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 16	0.600	0.120 0.081 359	0.016 128	0.002 232	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 17	0.650	0.080 0.020 135	0.006 159	0.002 246	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
MARSHALL ANALYSIS									
DATA	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8
ALPHA	10.332 0	0.972 350	0.159 329	0.036 15	0.030 240	0.000 152	0.000 152	0.011 160	0.022 150
CM	0.409 0	0.073 21	0.012 353	0.004 346	0.002 27	0.003 275	0.003 275	0.004 125	0.015 135
CM	-0.013	0.001 296	0.002 37	0.001 212	0.001 149	0.001 108	0.001 108	0.002 294	0.007 340
UCP 1	0.051	0.267 247	0.075 24	0.128 235	0.006 101	0.007 74	0.007 74	0.034 287	0.061 23
UCP 2	0.020	0.242 350	0.051 357	0.018 351	0.007 291	0.003 103	0.003 103	0.019 309	0.003 47
UCP 3	0.030	1.101 3637	0.286 351	0.012 324	0.007 291	0.003 103	0.003 103	0.011 313	0.034 42
UCP 4	0.049	0.927 2.951 351	0.274 349	0.009 339	0.011 358	0.001 14	0.001 14	0.006 255	0.035 55
UCP 5	0.074	0.912 2.389 351	0.191 346	0.007 315	0.009 351	0.006 233	0.006 233	0.012 287	0.029 44
UCP 6	0.099	1.005 1.946 353	0.163 32	0.007 337	0.009 359	0.002 164	0.002 164	0.036 337	0.032 28
UCP 7	0.149	0.704 1.518 355	0.132 5	0.006 240	0.003 142	0.005 116	0.005 116	0.002 3	0.020 53
UCP 8	0.209	0.629 1.210 359	0.108 16	0.002 182	0.004 113	0.014 266	0.014 266	0.015 286	0.034 42
UCP 9	0.250	0.512 1.074 359	0.082 17	0.001 351	0.003 6	0.003 147	0.003 147	0.009 155	0.015 168
UCP 10	0.300	0.419 0.846 359	0.064 26	0.011 43	0.007 236	0.003 235	0.003 235	0.009 145	0.016 130
UCP 11	0.349	0.349 0.735 359	0.044 42	0.013 352	0.007 236	0.003 235	0.003 235	0.009 145	0.016 130
UCP 12	0.400	0.288 0.547 359	0.037 37	0.006 4	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 13	0.450	0.240 0.412 359	0.031 41	0.002 133	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 14	0.500	0.200 0.288 359	0.025 52	0.003 336	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 15	0.550	0.160 0.172 359	0.020 63	0.003 132	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 16	0.600	0.120 0.081 359	0.016 128	0.002 232	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130
UCP 17	0.650	0.080 0.020 135	0.006 159	0.002 246	0.003 235	0.003 235	0.003 235	0.009 145	0.016 130

FORCED PITCHING OSCILLATION									
AIRFOIL					NLR 1				
TUNED MZ	DRIVE MZ	N	MACH %	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
U.O	23.01	0.177	0.193	0.0	0.0	7.47	12171.4	20	EXT DAMP
V	66.3	11391.	CHIM	CHIMAX	ALPHA-MAX	REMO DAMP	TOR	0.0	0.0
(217.5)	(237.9)	(237.9)	0.0	1.624	17.11	-0.00134	0.727		
MANUATIC ANALYSIS									
DATA	A/C	RFS 0	RFS 1	RFS 2	RFS 3	RFS 4	RFS 5	RFS 6	RFS 7
TYPE		PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
ALPHA									
1		10.323	0	0.993	355	0.167	323	0.046	27
2		0.751	0.847	12	0.130	328	0.036	93	0.006
3		0.016	0.035	268	0.022	214	0.033	279	0.003
4		0.010	0.011	16	0.115	154	0.114	50	0.002
5		0.023	0.023	356	0.123	274	0.044	234	0.020
6		0.023	0.023	356	0.123	274	0.044	234	0.020
7		0.023	0.023	356	0.123	274	0.044	234	0.020
8		0.023	0.023	356	0.123	274	0.044	234	0.020
9		0.023	0.023	356	0.123	274	0.044	234	0.020
10		0.023	0.023	356	0.123	274	0.044	234	0.020
11		0.023	0.023	356	0.123	274	0.044	234	0.020
12		0.023	0.023	356	0.123	274	0.044	234	0.020
13		0.023	0.023	356	0.123	274	0.044	234	0.020
14		0.023	0.023	356	0.123	274	0.044	234	0.020
15		0.023	0.023	356	0.123	274	0.044	234	0.020
16		0.023	0.023	356	0.123	274	0.044	234	0.020
17		0.023	0.023	356	0.123	274	0.044	234	0.020

FORCED PITCHING OSCILLATION									
AIRFOIL					NLR 1				
TUNED MZ	DRIVE MZ	N	MACH %	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
U.O	23.03	0.177	0.193	0.0	0.0	7.47	12171.2	23	EXT DAMP
V	66.0	11328.	CHIM	CHIMAX	ALPHA-MAX	REMO DAMP	TOR	0.0	0.0
(216.7)	(236.6)	(236.6)	0.0	1.624	17.11	-0.00134	0.727		
MANUATIC ANALYSIS									
DATA	A/C	RFS 0	RFS 1	RFS 2	RFS 3	RFS 4	RFS 5	RFS 6	RFS 7
TYPE		PHI	PHI	PHI	PHI	PHI	PHI	PHI	PHI
ALPHA									
1		10.323	0	0.993	355	0.167	323	0.046	27
2		0.751	0.847	12	0.130	328	0.036	93	0.006
3		0.016	0.035	268	0.022	214	0.033	279	0.003
4		0.010	0.011	16	0.115	154	0.114	50	0.002
5		0.023	0.023	356	0.123	274	0.044	234	0.020
6		0.023	0.023	356	0.123	274	0.044	234	0.020
7		0.023	0.023	356	0.123	274	0.044	234	0.020
8		0.023	0.023	356	0.123	274	0.044	234	0.020
9		0.023	0.023	356	0.123	274	0.044	234	0.020
10		0.023	0.023	356	0.123	274	0.044	234	0.020
11		0.023	0.023	356	0.123	274	0.044	234	0.020
12		0.023	0.023	356	0.123	274	0.044	234	0.020
13		0.023	0.023	356	0.123	274	0.044	234	0.020
14		0.023	0.023	356	0.123	274	0.044	234	0.020
15		0.023	0.023	356	0.123	274	0.044	234	0.020
16		0.023	0.023	356	0.123	274	0.044	234	0.020
17		0.023	0.023	356	0.123	274	0.044	234	0.020

REPRODUCTION
ORIGINAL

FORCED PITCHING OSCILLATION									
TUNED HZ	DRIVE HZ	K	MACH NO	DEL ALPHA	DEL L	DEL M	DEL N	DEL O	DEL P
0.0	24.97	0.116	0.297	10.31	0.0	0.0	0.0	0.0	0.0
V	Q	RN	CHIMINI	CHIMINI	ALPHA-MAX	ALPHA-MAX	ALPHA-MAX	ALPHA-MAX	ALPHA-MAX
101.1 (331.8)	26492. (553.3)	0.48E 07	-0.213	1.047	1.047	1.047	1.047	1.047	1.047
DATA TYPE	X/C	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI
ALPHA		7.496	0.443 357	0.144 324	0.07 313	0.007 192	0.000 50	0.046 188	0.033 157
CM		0.077	0.113 261	0.01 164	0.01 164	0.01 164	0.01 164	0.031 266	0.018 223
		-0.028	0.045 221	0.036 91	0.023 282	0.020 208	0.014 128	0.010 59	0.006 9
DCP 1	-0.10	2.140	2.042 346	0.925 349	0.404 289	0.223 259	0.144 227	0.149 176	0.144 129
DCP 2	-0.20	1.926	1.712 312	0.774 311	0.342 274	0.193 231	0.084 199	0.113 174	0.092 123
DCP 3	-0.30	1.848	1.543 283	0.703 348	0.330 284	0.143 231	0.067 222	0.130 179	0.104 76
DCP 4	-0.40	1.924	1.925 317	0.444 333	0.217 263	0.122 190	0.064 117	0.040 43	0.112 123
DCP 5	-0.50	1.715	1.851 317	0.357 317	0.167 273	0.100 157	0.054 75	0.026 42	0.043 11
DCP 6	-0.60	1.574	1.915 317	0.318 304	0.162 273	0.101 139	0.059 63	0.032 4	0.033 335
DCP 7	-0.70	1.244	1.700 13	0.287 281	0.162 273	0.098 121	0.075 52	0.042 354	0.038 316
DCP 8	-0.80	1.029	1.028 16	0.493 12	0.255 279	0.162 176	0.097 53	0.062 117	0.044 308
DCP 9	-0.90	0.840	0.787 16	0.427 359	0.238 260	0.162 176	0.108 42	0.070 108	0.050 264
DCP10	-0.95	0.719	0.688 16	0.302 349	0.233 251	0.147 167	0.103 20	0.087 298	0.033 252
DCP11	-0.98	0.548	0.630 22	0.228 319	0.154 224	0.118 97	0.104 15	0.087 298	0.043 251
DCP12	-0.99	0.463	0.510 24	0.186 326	0.145 235	0.100 65	0.084 350	0.061 273	0.037 235
DCP13	-0.99	0.378	0.378 27	0.141 310	0.119 118	0.095 39	0.084 321	0.061 273	0.033 203
DCP14	-0.99	0.285	0.290 23	0.129 284	0.116 171	0.089 21	0.078 300	0.061 273	0.033 174
DCP15	-0.99	0.162	0.162 17	0.087 275	0.065 86	0.074 11	0.062 237	0.038 210	0.034 165
DCP16	-0.99	0.047	0.047 16	0.044 271	0.022 197	0.045 86	0.038 260	0.021 211	0.018 133
DCP17	-0.99					0.011 136	0.021 12	0.012 148	0.008 206

TEST POINT
12175.5
FOR
0.741
EXT DAMP
0.0

CYCLES ANALYSED
20
0.007
0.0

ALPHA.0
7.50
ALPHA-MAX
1.047

DEL ALPHA
0.0
DEL L
0.0
DEL M
0.0
DEL N
0.0
DEL O
0.0
DEL P
0.0

ALPHA.0
7.50
ALPHA-MAX
1.047

DEL ALPHA
0.0
DEL L
0.0
DEL M
0.0
DEL N
0.0
DEL O
0.0
DEL P
0.0

ALPHA.0
7.50
ALPHA-MAX
1.047

DEL ALPHA
0.0
DEL L
0.0
DEL M
0.0
DEL N
0.0
DEL O
0.0
DEL P
0.0

ALPHA.0
7.50
ALPHA-MAX
1.047

DEL ALPHA
0.0
DEL L
0.0
DEL M
0.0
DEL N
0.0
DEL O
0.0
DEL P
0.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.92	0.087	0.34	0.0	0.0	4.95	12177.3	70	
V	Q	RM	CHIM(1)	CHIMAX	ALPHA-MAX	AFR3 DAMP	TOR	EXT DAMP	
134.3	47071.	0.645 07	-0.121	1.406	15.12	-0.00091	0.981	0.0	
(440.6)	(983.1)								
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI
ALPHA		4.048	10.309 0	0.982 353	0.189 379	0.028 300	0.040 224	0.087 130	0.045 281
CN		0.482	0.749 4	0.233 23	0.090 295	0.035 198	0.021 134	0.021 55	0.022 319
CM		-0.016	0.028 299	0.024 114	0.024 21	0.016 291	0.009 229	0.008 173	0.007 113
DCP 1		1.490	4.737 348	1.341 62	0.777 29	0.451 306	0.264 255	0.126 240	0.186 218
DCP 2		0.020	1.441	0.986 59	0.526 4	0.275 315	0.172 262	0.100 211	0.107 214
DCP 3		0.030	1.308	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 4		0.049	1.389	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 5		0.074	1.268	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 6		0.099	1.164	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 7		0.149	0.904	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 8		0.200	0.740	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 9		0.250	0.600	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 10		0.300	0.500	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 11		0.350	0.400	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 12		0.400	0.300	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 13		0.450	0.200	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 14		0.500	0.100	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 15		0.550	0.050	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 16		0.600	0.025	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 17		0.650	0.012	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171

FORCED PITCHING OSCILLATION									
AIRFOIL NLR 1									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.96	0.087	0.34	0.0	0.0	7.51	12177.4	20	
V	Q	RM	CHIM(1)	CHIMAX	ALPHA-MAX	AERO DAMP	TOR	EXT DAMP	
133.9	46927.	0.645 07	-0.121	1.406	15.12	-0.00106	1.135	0.0	
(439.4)	(980.1)								
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI
ALPHA		7.512	13.245 0	0.941 358	0.163 347	0.075 16	0.060 315	0.129 217	0.078 114
CN		0.638	0.820 12	0.282 31	0.084 323	0.046 286	0.036 212	0.022 170	0.030 114
CM		-0.027	0.048 228	0.038 118	0.022 38	0.011 22	0.016 330	0.011 267	0.009 245
DCP 1		2.336	1.117 344	1.613 77	0.804 34	0.297 8	0.310 349	0.204 298	0.132 311
DCP 2		0.010	1.493	0.986 59	0.526 4	0.275 315	0.172 262	0.100 211	0.107 214
DCP 3		0.030	1.308	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 4		0.049	1.389	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 5		0.074	1.268	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 6		0.099	1.164	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 7		0.149	0.904	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 8		0.200	0.740	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 9		0.250	0.600	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 10		0.300	0.500	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 11		0.350	0.400	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 12		0.400	0.300	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 13		0.450	0.200	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 14		0.500	0.100	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 15		0.550	0.050	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 16		0.600	0.025	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171
DCP 17		0.650	0.012	0.959 59	0.518 4	0.269 304	0.172 239	0.100 171	0.107 171

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	22.97	0.088	0.346	1.025	0.0	9.89	12177.5	20	
V	Q	BN	CHMIN1	CHMAX1	ALPHA-MAX	AERO DAMP	TRP	EXT DAMP	
133.7 (438.5)	46860. (978.7)	0.64E 07	-0.223	1.739	17.13	-0.00131	1.404	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		10.254	0	0.943	3.87	0.091	36	0.141	320
CM		0.763	0.509	26	0.076	358	0.045	313	0.021
		-0.037	0.069	219	0.044	125	0.022	57	0.011
DCP 1	-010	2.870	1.646	340	1.820	82	0.409	60	0.274
DCP 2	-020	2.407	1.380	355	1.410	76	0.496	58	0.275
DCP 3	-030	2.148	0.950	393	1.381	78	0.287	43	0.246
DCP 4	-040	2.051	0.866	14	1.144	63	0.300	39	0.241
DCP 5	-074	1.840	0.716	23	0.976	53	0.271	33	0.190
DCP 6	-099	1.442	0.708	27	0.827	52	0.161	29	0.183
DCP 7	-149	1.141	0.791	28	0.622	41	0.134	16	0.148
DCP 8	-200	1.136	0.709	29	0.502	42	0.127	342	0.087
DCP 9	-250	1.022	0.693	27	0.430	32	0.113	357	0.067
DCP 10	-300	0.919	0.623	20	0.359	29	0.117	357	0.055
DCP 11	-399	0.794	0.603	31	0.297	24	0.098	349	0.046
DCP 12	-501	0.636	0.546	32	0.243	11	0.080	326	0.039
DCP 13	-600	0.531	0.480	33	0.208	357	0.069	372	0.034
DCP 14	-701	0.492	0.391	37	0.185	342	0.062	274	0.034
DCP 15	-800	0.320	0.334	31	0.155	325	0.068	267	0.034
DCP 16	-900	0.222	0.222	22	0.106	312	0.051	271	0.028
DCP 17	-969	0.079	0.079	24	0.046	313	0.036	296	0.028
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		10.254	0	0.943	3.87	0.091	36	0.141	320
CM		0.763	0.509	26	0.076	358	0.045	313	0.021
		-0.037	0.069	219	0.044	125	0.022	57	0.011
DCP 1	-010	2.870	1.646	340	1.820	82	0.409	60	0.274
DCP 2	-020	2.407	1.380	355	1.410	76	0.496	58	0.275
DCP 3	-030	2.148	0.950	393	1.381	78	0.287	43	0.246
DCP 4	-040	2.051	0.866	14	1.144	63	0.300	39	0.241
DCP 5	-074	1.840	0.716	23	0.976	53	0.271	33	0.190
DCP 6	-099	1.442	0.708	27	0.827	52	0.161	29	0.183
DCP 7	-149	1.141	0.791	28	0.622	41	0.134	16	0.148
DCP 8	-200	1.136	0.709	29	0.502	42	0.127	342	0.087
DCP 9	-250	1.022	0.693	27	0.430	32	0.113	357	0.067
DCP 10	-300	0.919	0.623	20	0.359	29	0.117	357	0.055
DCP 11	-399	0.794	0.603	31	0.297	24	0.098	349	0.046
DCP 12	-501	0.636	0.546	32	0.243	11	0.080	326	0.039
DCP 13	-600	0.531	0.480	33	0.208	357	0.069	372	0.034
DCP 14	-701	0.492	0.391	37	0.185	342	0.062	274	0.034
DCP 15	-800	0.320	0.334	31	0.155	325	0.068	267	0.034
DCP 16	-900	0.222	0.222	22	0.106	312	0.051	271	0.028
DCP 17	-969	0.079	0.079	24	0.046	313	0.036	296	0.028

FORCED PITCHING OSCILLATION									
TUNED FZ	DRIVE FZ	K	MACH NO	DEL ALPHA	DEL M	ALPHA-0	TEST POINT	CYCLES ANALYSED	
0.0	45.64	0.171	0.400	11.06	0.0	0.00	12170.1	20	
V	Q	BN	CHMIN1	CHMAX1	ALPHA-MAX	AERO DAMP	TRP	EXT DAMP	
135.9 (446.0)	48043. (1003.4)	0.64E 07	-0.096	1.005	11.33	-0.00082	0.916	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		11.064	0	1.193	355	0.054	208	0.051	107
CM		0.160	0.905	1	0.032	67	0.020	152	0.003
		-0.012	0.045	291	0.015	251	0.011	288	0.003
DCP 1	-010	0.540	5.009	350	1.019	239	0.433	352	0.278
DCP 2	-020	0.277	1.856	355	0.303	236	0.265	321	0.103
DCP 3	-030	0.206	1.811	352	0.174	4	0.128	318	0.051
DCP 4	-040	0.437	3.123	354	0.090	33	0.101	288	0.045
DCP 5	-074	0.399	2.694	353	0.240	41	0.144	254	0.043
DCP 6	-099	0.422	2.300	354	0.269	42	0.107	241	0.043
DCP 7	-149	0.258	1.819	354	0.299	40	0.102	205	0.043
DCP 8	-200	0.217	1.461	0	0.251	44	0.078	194	0.033
DCP 9	-250	0.166	1.292	356	0.257	32	0.054	258	0.025
DCP 10	-300	0.150	1.777	357	0.235	28	0.048	193	0.021
DCP 11	-399	0.158	0.833	7	0.168	37	0.064	133	0.015
DCP 12	-501	0.137	0.617	13	0.109	43	0.057	53	0.007
DCP 13	-600	0.155	0.469	21	0.087	55	0.043	58	0.007
DCP 14	-701	0.214	0.326	27	0.074	60	0.037	89	0.008
DCP 15	-800	0.104	0.207	41	0.055	79	0.027	97	0.011
DCP 16	-900	0.060	0.107	80	0.036	114	0.014	119	0.007
DCP 17	-969	0.039	0.056	137	0.022	131	0.022	148	0.006

FORCED PITCHING OSCILLATION									
TUNED HZ	DRIVE HZ	K	WARM NO	DEL ALPHA	DEL H	ALPHA.O	TEST POINT	CYCLES ANALYSED	
V	Q	RN	CHIMINI	CHIMAXI	ALPHA.NMAX	ALPHA.O	TOP	EXT DAMP	
(439.7)	(474.8)	0.64F 07	-0.076	1.223	13.60	2.48	12179.2	0.0	
HARMONIC ANALYSIS									
DATA TYPE	X/C	RFS 0	RFS 1 PMI	RFS 2 PMI	RFS 3 PMI	RFS 4 PMI	RFS 5 PMI	RFS 6 PMI	RFS 7 PMI
ALPHA		2.483	11.066	0	0.406	0.034	0.061	0.031	0.030
CM		0.337	0.850	4	0.013	0.007	0.014	0.006	0.004
CM		-0.009	0.055	294	0.010	0.007	0.006	0.002	0.002
DCP 1	-0.10	0.456	5.490	346	0.774	0.455	0.454	0.293	0.170
DCP 2	-0.20	0.725	4.300	353	0.879	0.272	0.131	0.151	0.075
DCP 3	-0.30	0.857	3.878	352	0.802	0.244	0.090	0.126	0.072
DCP 4	-0.40	0.981	3.123	353	0.823	0.113	0.099	0.066	0.023
DCP 5	-0.74	0.941	2.540	353	0.735	0.021	0.039	0.047	0.012
DCP 6	-0.99	0.894	2.122	355	0.669	0.056	0.152	0.049	0.017
DCP 7	-1.49	0.686	1.854	357	0.531	0.043	0.350	0.026	0.012
DCP 8	-2.00	0.757	1.354	3	0.032	0.034	0.44	0.021	0.012
DCP 9	-2.50	0.462	1.195	3	0.014	0.040	0.36	0.016	0.001
DCP 10	-3.00	0.431	0.955	3	0.025	0.036	0.15	0.021	0.001
DCP 11	-3.99	0.356	0.744	14	0.027	0.044	0.27	0.016	0.001
DCP 12	-5.01	0.260	0.588	19	0.023	0.030	0.24	0.018	0.001
DCP 13	-6.00	0.223	0.444	28	0.018	0.024	0.4	0.017	0.001
DCP 14	-7.01	0.245	0.309	41	0.022	0.021	0.4	0.015	0.001
DCP 15	-8.00	0.116	0.210	52	0.038	0.025	0.32	0.012	0.001
DCP 16	-9.00	-0.063	0.101	67	0.016	0.025	0.00	0.003	0.001
DCP 17	-9.69	-0.050	0.045	131	0.017	0.012	0.303	0.002	0.001
HARMONIC ANALYSIS									
DATA TYPE	X/C	RFS 0	RFS 1 PMI	RFS 2 PMI	RFS 3 PMI	RFS 4 PMI	RFS 5 PMI	RFS 6 PMI	RFS 7 PMI
ALPHA		4.914	11.000	0	0.400	0.087	0.042	0.023	0.035
CM		0.489	0.845	12	0.039	0.014	0.024	0.012	0.005
CM		-0.020	0.047	252	0.031	0.017	0.012	0.007	0.002
DCP 1	-0.10	1.222	4.494	349	0.728	0.482	0.202	0.086	0.131
DCP 2	-0.20	1.179	3.642	357	0.576	0.288	0.148	0.142	0.091
DCP 3	-0.30	1.149	2.732	359	0.646	0.342	0.121	0.121	0.092
DCP 4	-0.40	1.358	2.578	0	0.762	0.195	0.057	0.089	0.120
DCP 5	-0.74	1.268	2.117	2	0.664	0.167	0.037	0.010	0.044
DCP 6	-0.99	1.166	1.912	4	0.562	0.110	0.037	0.039	0.095
DCP 7	-1.49	0.931	1.505	7	0.443	0.093	0.156	0.036	0.030
DCP 8	-2.00	0.782	1.295	13	0.370	0.092	0.148	0.047	0.046
DCP 9	-2.50	0.687	1.164	11	0.330	0.074	0.140	0.059	0.037
DCP 10	-3.00	0.625	1.010	12	0.268	0.059	0.119	0.058	0.032
DCP 11	-3.99	0.538	0.875	20	0.201	0.061	0.104	0.050	0.029
DCP 12	-5.01	0.410	0.699	22	0.149	0.041	0.10	0.047	0.028
DCP 13	-6.00	0.332	0.541	29	0.107	0.04	0.06	0.046	0.021
DCP 14	-7.01	0.329	0.398	35	0.076	0.029	0.06	0.023	0.015
DCP 15	-8.00	0.187	0.237	35	0.074	0.021	0.03	0.019	0.008
DCP 16	-9.00	-0.028	0.141	31	0.049	0.040	0.00	0.032	0.003
DCP 17	-9.69	-0.042	0.024	57	0.048	0.017	0.00	0.018	0.001

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION									
TUNED MZ		DRIVE MZ		MACH NO		DEL-ALPHA		DEL-H	
0.0		45.67		0.395		10.85		0.0	
V		Q		CM(MIN)		CM(MAX)		ALPHA-MAX	
133.7		46932.		-0.250		1.785		16.75	
(438.6)		(990.2)							
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		10.850	0	1.268	0.494	0.194	0.043	0.026	0.076
CN		0.620	17	0.223	0.034	0.024	0.023	0.011	0.010
CW		-0.039	0.076	0.215	0.041	0.025	0.014	0.006	0.004
DCP 1	-0.10	1.983	2.869	348	1.789	62	0.967	359	0.200
DCP 2	-0.20	1.716	2.359	359	1.405	60	0.718	0	0.154
DCP 3	-0.30	1.649	1.924	2	1.337	56	0.703	351	0.154
DCP 4	-0.40	1.789	1.960	6	0.937	41	0.423	340	0.112
DCP 5	-0.50	1.828	1.399	4	1.023	13	0.368	317	0.112
DCP 6	-0.60	1.903	1.493	13	0.698	26	0.277	318	0.204
DCP 7	-0.70	1.223	1.328	15	0.540	11	0.217	301	0.069
DCP 8	-0.80	1.034	1.198	21	0.449	12	0.217	301	0.049
DCP 9	-0.90	0.929	1.113	18	0.401	353	0.187	270	0.047
DCP 10	-0.99	0.842	1.008	19	0.348	344	0.157	270	0.047
DCP 11	-0.99	0.737	0.926	23	0.280	336	0.116	254	0.069
DCP 12	-0.99	0.591	0.796	23	0.227	314	0.106	209	0.077
DCP 13	-0.99	0.517	0.700	26	0.235	290	0.138	176	0.081
DCP 14	-0.99	0.484	0.535	26	0.220	289	0.149	149	0.081
DCP 15	-0.99	0.299	0.401	23	0.205	254	0.167	136	0.081
DCP 16	-0.99	0.034	0.222	12	0.137	237	0.098	122	0.081
DCP 17	-0.99	0.017	0.072	9	0.081	751	0.048	135	0.081
HARMONIC ANALYSIS									
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI
ALPHA		11.494	0	2.131	0.265	0.130	0.037	0.019	0.048
CN		0.895	4	0.189	0.008	0.007	0.016	0.010	0.007
CW		-0.013	0.066	0.024	0.015	0.011	0.006	0.003	0.002
DCP 1	-0.10	4.804	351	0.894	0.918	235	0.291	323	0.259
DCP 2	-0.20	3.802	357	0.341	0.507	244	0.196	266	0.113
DCP 3	-0.30	3.455	352	0.361	0.243	231	0.166	295	0.069
DCP 4	-0.40	3.026	355	0.287	0.268	206	0.190	255	0.055
DCP 5	-0.50	2.254	356	0.426	0.165	154	0.149	213	0.061
DCP 6	-0.60	1.776	356	0.441	0.130	119	0.130	179	0.057
DCP 7	-0.70	1.463	351	0.404	0.121	103	0.107	171	0.039
DCP 8	-0.80	1.275	358	0.393	0.111	66	0.097	121	0.037
DCP 9	-0.90	1.061	359	0.345	0.111	35	0.083	87	0.037
DCP 10	-0.99	0.824	351	0.272	0.098	29	0.072	80	0.037
DCP 11	-0.99	0.635	351	0.174	0.076	330	0.075	15	0.037
DCP 12	-0.99	0.496	351	0.142	0.060	330	0.048	6	0.037
DCP 13	-0.99	0.365	351	0.117	0.048	330	0.034	345	0.037
DCP 14	-0.99	0.246	351	0.089	0.034	330	0.032	340	0.037
DCP 15	-0.99	0.141	351	0.066	0.022	334	0.026	357	0.037
DCP 16	-0.99	0.057	351	0.037	0.011	351	0.023	357	0.037
DCP 17	-0.99	0.017	351	0.017	0.006	351	0.017	351	0.037

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL NLR 1				CYCLES ANALYSED			
		TUNED HZ 0.0	DRIVE HZ 68.53	K 0.259	MACH NO 0.400	DEL-ALPHA 11.65	DEL-H 0.0	ALPHA-0 2.49	TEST POINT 12187.2	RES 7 PHI	RES 8 PHI	RES 9 PHI	EXT DAMP 0.0
ALPHA CN Cp		2.493 0.324 -0.012	11.495 0.853 0.075	0 10 10	0.290 0.292 0.292	0.119 0.116 0.111	0.018 0.008 0.005	0.022 0.005 0.002	0.031 0.004 0.001	0.139 0.209 0.104	0.024 0.004 0.002	0.012 0.003 0.000	0.212 0.189 0.345
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	EXT DAMP	
ALPHA		0.645	4.094	344	0.655	288	0.573	255	0.359	65	0.401	50	0.051
CP 1		0.634	4.075	353	0.608	5	0.327	236	0.131	121	0.177	54	0.073
CP 2		0.781	3.740	352	0.774	359	0.171	248	0.127	95	0.132	23	0.091
CP 3		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 4		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 5		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 6		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 7		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 8		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 9		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 10		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 11		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 12		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 13		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 14		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042
CP 15		0.345	0.518	353	0.624	353	0.177	178	0.021	114	0.111	316	0.042

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL NLR 1				CYCLES ANALYSED			
		TUNED HZ 0.0	DRIVE HZ 68.54	K 0.267	MACH NO 0.397	DEL-ALPHA 11.66	DEL-H 0.0	ALPHA-0 5.00	TEST POINT 12187.3	RES 7 PHI	RES 8 PHI	RES 9 PHI	EXT DAMP 0.0
ALPHA CN Cp		5.001 0.516 -0.025	11.463 0.908 0.062	0 14 256	0.240 0.037 0.028	0.100 0.011 0.018	0.033 0.017 0.012	0.015 0.011 0.018	0.037 0.006 0.006	0.127 0.280 0.168	0.033 0.001 0.004	0.036 0.005 0.006	0.189 0.136 0.346
DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	EXT DAMP	
ALPHA		1.064	4.423	344	0.690	351	0.425	240	0.253	182	0.065	165	0.074
CP 1		1.129	3.338	357	0.568	334	0.355	259	0.196	191	0.117	136	0.061
CP 2		1.157	2.823	358	0.524	314	0.296	233	0.133	169	0.089	142	0.111
CP 3		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 4		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 5		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 6		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 7		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 8		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 9		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 10		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 11		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 12		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 13		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 14		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042
CP 15		0.649	1.997	2.677	0.865	9	0.201	210	0.096	141	0.061	93	0.042

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[illegible]

DATA TYPE	Z/L	FORCED PITCHING OSCILLATION				AIRFOIL				TEST POINT				CYCLES ANALYSIS			
		TUNED MZ G.U	UNIVE MZ 25.10	R 0.000	MACH NO 0.000	ELL ALPHA 10.22	DELTA 0.0	ALPHA 1.45	ALPHA MAX 11.47	ALPHA DAMP -0.00107	TEST POINT 12103.2	EXT DAMP 0.0	EXT DAMP 0.0	TEST POINT 12103.2	EXT DAMP 0.0	EXT DAMP 0.0	EXT DAMP 0.0
ALPHA		198.3 (656.6)	102321. (2157.9)	0	0.000	10.22	0.0	1.45	11.47	-0.00107	1.087			1.087			
DATA TYPE	Z/L	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15
ALPHA		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DATA TYPE	Z/L	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15
ALPHA		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

DATA TYPE	Z/L	FORCED PITCHING OSCILLATION				AIRFOIL				TEST POINT				CYCLES ANALYSIS			
		197.4 (647.8)	102808. (2147.2)	0	0.000	10.22	0.0	1.45	11.47	-0.00107	1.087			1.087			
ALPHA		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DATA TYPE	Z/L	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15
ALPHA		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

TUNING C.O	W2	FORCED PITCHING OSCILLATION			AIRPCIL			NLR 1			TEST POINT 12185.3	CYCLES ANALYSED 20							
		DRIVE M7 23.20	K 0.052	MACH NO 0.698	DEL-ALPHA 10.17	DEL-M 0.0	ALPHA-0 4.97	ALPHA-MAX AERO DAMP 0.00142	EXT DAMP 0.0										
/	Q 226.0 (741.6)	127256. (2657.8)	RN 0.10E 08	CHIMINI -0.134	HARMONIC ANALYSIS								TOR 2.562	EXT DAMP 0.0					
					RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7			RES 8	RES 9	RES 10		
ALPHA	4.97C	10.171	0	0.915	4	0.105	343	0.095	70	0.066	87	0.066	7	0.056	337	0.070	197	0.037	171
PHI	0.451	0.787	1	0.300	41	0.076	4	0.063	353	0.047	285	0.023	279	0.006	261	0.014	236	0.011	166
CHI	0.637	0.648	242	0.029	109	0.008	11	0.015	104	0.008	65	0.007	17	0.003	334	0.004	353	0.004	308
CHI	0.472	3.247	347	0.965	90	0.340	4	0.357	1	0.110	67	0.027	303	0.053	59	0.081	131	0.027	163
CHI	0.492	2.691	350	0.882	51	0.289	25	0.274	1	0.108	89	0.018	244	0.020	157	0.072	161	0.057	184
CHI	0.517	2.686	349	0.916	52	0.269	38	0.218	353	0.085	85	0.072	212	0.059	178	0.053	162	0.072	193
CHI	0.481	2.607	350	0.825	45	0.208	74	0.157	359	0.056	110	0.090	176	0.074	184	0.025	156	0.017	167
CHI	0.458	1.581	348	0.908	53	0.277	74	0.059	36	0.044	278	0.027	247	0.064	183	0.098	255	0.038	330
CHI	0.850	1.502	348	0.952	53	0.163	50	0.144	100	0.102	275	0.129	318	0.057	14	0.086	258	0.047	353
CHI	0.755	1.135	355	0.781	57	0.112	32	0.186	61	0.159	276	0.194	342	0.092	3	0.073	26	0.052	156
CHI	0.706	0.950	0	0.551	52	0.138	0	0.195	30	0.118	298	0.136	340	0.058	306	0.081	347	0.039	167
CHI	0.641	0.838	6	0.369	47	0.169	359	0.137	12	0.125	325	0.056	337	0.079	305	0.041	311	0.039	245
CHI	0.528	0.735	11	0.213	38	0.134	3	0.074	342	0.065	335	0.023	222	0.022	293	0.021	201	0.020	288
CHI	0.425	0.630	15	0.178	22	0.078	2	0.082	319	0.044	300	0.035	230	0.018	230	0.031	210	0.015	182
CHI	0.367	0.527	15	0.153	5	0.055	4	0.084	308	0.042	264	0.043	229	0.022	193	0.033	206	0.030	160
CHI	0.377	0.365	25	0.128	344	0.010	44	0.069	302	0.035	233	0.037	204	0.021	149	0.024	196	0.030	136
CHI	0.215	0.295	22	0.117	313	0.009	249	0.058	282	0.044	213	0.032	186	0.023	127	0.015	146	0.023	108
CHI	0.025	0.182	15	0.097	302	0.033	294	0.053	270	0.043	222	0.031	183	0.020	130	0.016	159	0.018	92

**REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR**

DATA TYPE	FORCED				PITCHING				OSCILLATION				AIRPOIL				NLR 1				TEST POINT 12087.3	CYCLES ANA.*SED 20				
	TUNED HZ 0.0	DRIVE HZ 396.15	K 0.297	Q 11707. (244.5)	RN 0.32E 07	CHIMING -0.310	MACH NO 0.197	UEL-ALPHA 5.39	DEL-H 0.0	ALPHA-MAX 20.75	AERO DAMP 0.00253	TOR -1.637	EST DAMP 0.0	ALPHA-0 16.06	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5			RES 6	RES 7	RES 8	RES 9
HARMONIC ANALYSIS																										
ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM	ALPHA CM		
DCP 1	0.10	4.19E	2.030	77	0.751	20	0.451	30	0.434	305	0.330	271	0.138	258	0.105	88	0.099	239	0.028	197	0.015	141	0.013	140		
DCP 2	0.020	4.105	2.080	66	0.503	356	0.263	56	0.264	321	0.246	269	0.164	203	0.122	153	0.106	235	0.007	257	0.007	257	0.007	257		
DCP 3	0.030	4.046	2.218	56	0.825	334	0.175	252	0.215	193	0.126	93	0.084	340	0.114	285	0.055	70	0.007	257	0.007	257	0.007	257		
DCP 4	0.049	3.356	1.953	57	0.779	330	0.229	229	0.215	174	0.049	184	0.055	70	0.036	233	0.054	34	0.012	136	0.012	136	0.012	136		
DCP 5	0.074	2.977	1.737	48	0.655	311	0.198	207	0.102	137	0.027	153	0.075	19	0.047	251	0.035	351	0.040	246	0.040	246	0.040	246		
DCP 6	0.099	2.800	1.555	43	0.556	300	0.186	199	0.080	154	0.050	133	0.128	18	0.063	274	0.050	302	0.043	219	0.043	219	0.043	219		
DCP 7	0.149	2.251	1.367	31	0.465	281	0.156	187	0.066	106	0.086	128	0.136	351	0.055	261	0.047	281	0.049	144	0.049	144	0.049	144		
DCP 8	0.200	1.978	1.277	27	0.450	269	0.228	178	0.084	97	0.068	91	0.105	349	0.060	226	0.084	102	0.082	198	0.082	198	0.082	198		
DCP 9	0.250	1.785	1.085	9	0.412	215	0.221	143	0.155	15	0.097	306	0.096	226	0.084	102	0.082	198	0.082	198	0.082	198	0.082	198		
DCP10	0.300	1.600	0.963	1	0.417	198	0.243	84	0.212	335	0.124	236	0.097	163	0.085	169	0.082	198	0.082	198	0.082	198	0.082	198		
DCP11	0.399	1.315	0.792	2	0.358	187	0.223	68	0.191	337	0.136	214	0.094	89	0.085	169	0.082	198	0.082	198	0.082	198	0.082	198		
DCP12	0.501	1.038	0.606	356	0.339	168	0.213	41	0.113	292	0.113	184	0.076	83	0.047	271	0.047	271	0.047	271	0.047	271	0.047	271		
DCP13	0.600	0.897	0.448	352	0.336	151	0.228	9	0.130	251	0.114	125	0.121	317	0.029	197	0.042	55	0.015	31	0.015	31	0.015	31		
DCP14	0.701	0.694	0.357	345	0.320	120	0.226	343	0.153	204	0.131	58	0.104	276	0.094	138	0.097	355	0.032	137	0.032	137	0.032	137		
DCP15	0.800	0.472	0.281	320	0.31																					

DATA TYPE	X/C	RES 1 PHI				RES 2 PHI				RES 3 PHI				RES 4 PHI				DEL ALPHA				DEL M				ALPHA-O				TEST POINT				CYCLES ANALYSED																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		RES 0	RES 1	PHI		RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI	RES 19	PHI	RES 20	PHI	RES 21	PHI	RES 22	PHI	RES 23	PHI	RES 24	PHI	RES 25	PHI	RES 26	PHI	RES 27	PHI	RES 28	PHI	RES 29	PHI	RES 30	PHI	RES 31	PHI	RES 32	PHI	RES 33	PHI	RES 34	PHI	RES 35	PHI	RES 36	PHI	RES 37	PHI	RES 38	PHI	RES 39	PHI	RES 40	PHI	RES 41	PHI	RES 42	PHI	RES 43	PHI	RES 44	PHI	RES 45	PHI	RES 46	PHI	RES 47	PHI	RES 48	PHI	RES 49	PHI	RES 50	PHI	RES 51	PHI	RES 52	PHI	RES 53	PHI	RES 54	PHI	RES 55	PHI	RES 56	PHI	RES 57	PHI	RES 58	PHI	RES 59	PHI	RES 60	PHI	RES 61	PHI	RES 62	PHI	RES 63	PHI	RES 64	PHI	RES 65	PHI	RES 66	PHI	RES 67	PHI	RES 68	PHI	RES 69	PHI	RES 70	PHI	RES 71	PHI	RES 72	PHI	RES 73	PHI	RES 74	PHI	RES 75	PHI	RES 76	PHI	RES 77	PHI	RES 78	PHI	RES 79	PHI	RES 80	PHI	RES 81	PHI	RES 82	PHI	RES 83	PHI	RES 84	PHI	RES 85	PHI	RES 86	PHI	RES 87	PHI	RES 88	PHI	RES 89	PHI	RES 90	PHI	RES 91	PHI	RES 92	PHI	RES 93	PHI	RES 94	PHI	RES 95	PHI	RES 96	PHI	RES 97	PHI	RES 98	PHI	RES 99	PHI	RES 100	PHI	RES 101	PHI	RES 102	PHI	RES 103	PHI	RES 104	PHI	RES 105	PHI	RES 106	PHI	RES 107	PHI	RES 108	PHI	RES 109	PHI	RES 110	PHI	RES 111	PHI	RES 112	PHI	RES 113	PHI	RES 114	PHI	RES 115	PHI	RES 116	PHI	RES 117	PHI	RES 118	PHI	RES 119	PHI	RES 120	PHI	RES 121	PHI	RES 122	PHI	RES 123	PHI	RES 124	PHI	RES 125	PHI	RES 126	PHI	RES 127	PHI	RES 128	PHI	RES 129	PHI	RES 130	PHI	RES 131	PHI	RES 132	PHI	RES 133	PHI	RES 134	PHI	RES 135	PHI	RES 136	PHI	RES 137	PHI	RES 138	PHI	RES 139	PHI	RES 140	PHI	RES 141	PHI	RES 142	PHI	RES 143	PHI	RES 144	PHI	RES 145	PHI	RES 146	PHI	RES 147	PHI	RES 148	PHI	RES 149	PHI	RES 150	PHI	RES 151	PHI	RES 152	PHI	RES 153	PHI	RES 154	PHI	RES 155	PHI	RES 156	PHI	RES 157	PHI	RES 158	PHI	RES 159	PHI	RES 160	PHI	RES 161	PHI	RES 162	PHI	RES 163	PHI	RES 164	PHI	RES 165	PHI	RES 166	PHI	RES 167	PHI	RES 168	PHI	RES 169	PHI	RES 170	PHI	RES 171	PHI	RES 172	PHI	RES 173	PHI	RES 174	PHI	RES 175	PHI	RES 176	PHI	RES 177	PHI	RES 178	PHI	RES 179	PHI	RES 180	PHI	RES 181	PHI	RES 182	PHI	RES 183	PHI	RES 184	PHI	RES 185	PHI	RES 186	PHI	RES 187	PHI	RES 188	PHI	RES 189	PHI	RES 190	PHI	RES 191	PHI	RES 192	PHI	RES 193	PHI	RES 194	PHI	RES 195	PHI	RES 196	PHI	RES 197	PHI	RES 198	PHI	RES 199	PHI	RES 200	PHI	RES 201	PHI	RES 202	PHI	RES 203	PHI	RES 204	PHI	RES 205	PHI	RES 206	PHI	RES 207	PHI	RES 208	PHI	RES 209	PHI	RES 210	PHI	RES 211	PHI	RES 212	PHI	RES 213	PHI	RES 214	PHI	RES 215	PHI	RES 216	PHI	RES 217	PHI	RES 218	PHI	RES 219	PHI	RES 220	PHI	RES 221	PHI	RES 222	PHI	RES 223	PHI	RES 224	PHI	RES 225	PHI	RES 226	PHI	RES 227	PHI	RES 228	PHI	RES 229	PHI	RES 230	PHI	RES 231	PHI	RES 232	PHI	RES 233	PHI	RES 234	PHI	RES 235	PHI	RES 236	PHI	RES 237	PHI	RES 238	PHI

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED HZ 0.0	DRIVE HZ 39.70	K 0.280	MACH NO 0.209	DEL-ALPHA 8.10	DEL-H 0.0	ALPHA-0 14.84	TEST POINT 12169.2	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA													
CM													
DCP 1	-010	3.017	2.297	77	1.483	22	0.206	13	0.434	297	0.138	213	0.019
DCP 2	-020	3.413	2.280	69	1.348	18	0.266	37	0.328	301	0.098	206	0.075
DCP 3	-030	3.293	2.124	64	1.309	15	0.338	332	0.303	293	0.190	215	0.127
DCP 4	-040	3.154	1.994	48	1.084	0	0.428	265	0.163	199	0.126	125	0.079
DCP 5	-074	3.434	1.925	78	0.904	272	1.126	230	1.072	254	0.918	324	0.435
DCP 6	-099	2.663	1.738	40	0.728	314	0.303	241	0.177	182	0.152	52	0.087
DCP 7	-149	3.153	1.677	35	0.639	311	0.334	222	0.214	155	0.189	117	0.087
DCP 8	-200	1.878	1.568	34	0.629	307	0.327	188	0.197	140	0.169	100	0.102
DCP 9	-250	1.689	1.411	28	0.550	289	0.335	166	0.240	85	0.113	29	0.063
DCP10	-300	1.493	1.250	27	0.436	283	0.324	130	0.228	34	0.135	292	0.073
DCP11	-399	1.271	1.130	25	0.425	234	0.295	101	0.189	356	0.124	242	0.101
DCP12	-501	1.073	0.962	17	0.425	207	0.262	73	0.165	318	0.114	194	0.074
DCP13	-600	0.937	0.780	9	0.300	183	0.179	63	0.126	298	0.119	179	0.086
DCP14	-701	0.746	0.559	4	0.285	175	0.146	11	0.099	217	0.057	96	0.029
DCP15	-800	0.458	0.303	2	0.220	155	0.204	18	0.174	219	0.119	78	0.110
DCP16	-900	0.175	0.285	338	0.231	156							
DCP17	-969	0.151	0.279	322	0.231	156							

DATA TYPE	X/C	FORCED PITCHING OSCILLATION				AIRFOIL				CYCLES ANALYSED			
		TUNED HZ 0.0	DRIVE HZ 39.70	K 0.280	MACH NO 0.209	DEL-ALPHA 8.10	DEL-H 0.0	ALPHA-0 16.06	TEST POINT 12169.3	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA													
CM													
DCP 1	-010	3.011	2.225	92	1.426	31	0.459	34	0.435	310	0.176	306	0.044
DCP 2	-020	3.487	2.383	82	1.327	28	0.405	19	0.324	317	0.120	315	0.123
DCP 3	-030	3.408	2.146	78	1.330	27	0.395	3	0.401	316	0.150	216	0.126
DCP 4	-040	3.294	1.847	60	1.179	16	0.409	299	0.229	272	0.197	192	0.152
DCP 5	-074	3.799	2.054	97	0.363	288	0.977	237	1.370	254	1.211	316	0.084
DCP 6	-099	2.772	1.693	49	0.620	262	0.347	271	0.220	223	0.224	150	0.135
DCP 7	-149	2.224	1.638	43	0.704	332	0.350	256	0.223	185	0.175	130	0.073
DCP 8	-200	1.929	1.553	43	0.698	331	0.421	244	0.189	180	0.168	85	0.101
DCP 9	-250	1.727	1.469	35	0.640	310	0.444	217	0.272	158	0.210	102	0.122
DCP10	-300	1.544	1.297	31	0.543	300	0.434	206	0.210	120	0.181	71	0.085
DCP11	-399	1.356	1.202	29	0.500	285	0.433	191	0.210	103	0.181	46	0.101
DCP12	-501	1.153	1.049	19	0.452	252	0.405	157	0.202	64	0.173	300	0.085
DCP13	-600	0.998	0.874	10	0.444	219	0.369	122	0.260	90	0.163	241	0.076
DCP14	-701	0.792	0.647	3	0.421	196	0.313	95	0.222	351	0.153	241	0.069
DCP15	-800	0.498	0.433	354	0.305	180	0.216	73	0.132	330	0.134	218	0.099
DCP16	-900	0.232	0.373	334	0.280	159	0.235	25	0.159	230	0.108	86	0.076
DCP17	-969	0.180	0.308	321	0.256	162	0.259	23	0.213	241	0.183	97	0.157

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

TABLE A. ACCELERATION TARES

Transducer P1Average Orifice
Location, X/C = 0.010Units: psi
 $\Delta\alpha = 5^\circ$ (nominal).

F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.006					
		1.	0.014	-0.014	0.001	174.800
		2.	0.027	-0.021	-0.017	218.300
		3.	0.042	0.042	0.001	1.312
		4.	0.020	0.016	0.012	35.800
		5.	0.015	0.014	-0.006	336.200
		6.	0.017	0.016	0.005	15.890
		7.	0.012	0.012	0.003	15.670
		8.	0.023	0.002	-0.023	274.700
		9.	0.004	0.004	0.000	6.444
48.0	0.027					
		1.	0.140	-0.073	0.120	121.200
		2.	0.069	0.057	-0.038	326.800
		3.	0.018	0.018	0.002	4.738
		4.	0.079	0.064	0.047	36.200
		5.	0.010	0.009	0.003	15.320
		6.	0.018	0.014	0.011	37.460
		7.	0.013	0.011	0.007	32.480
		8.	0.011	0.010	-0.005	335.000
		9.	0.009	-0.004	0.008	116.000
56.2	-0.005					
		1.	0.077	0.077	0.008	6.237
		2.	0.026	-0.026	-0.001	182.500
		3.	0.071	-0.069	-0.019	195.500
		4.	0.026	0.023	0.012	26.900
		5.	0.023	0.023	0.001	1.818
		6.	0.033	-0.008	0.032	103.800
		7.	0.006	-0.004	0.005	127.000
		8.	0.005	0.005	-0.000	356.500
		9.	0.011	-0.008	-0.008	222.400
71.8	0.003					
		1.	0.038	-0.036	-0.012	198.600
		2.	0.019	0.004	0.018	77.590
		3.	0.029	-0.012	0.027	113.700
		4.	0.009	0.008	0.005	32.060
		5.	0.014	0.012	-0.006	332.200
		6.	0.012	0.002	0.012	74.600
		7.	0.006	-0.003	-0.005	242.600
		8.	0.008	0.006	0.005	38.420
		9.	0.006	0.005	-0.002	341.200

TABLE B. ACCELERATION TARES

Transducer P2		Acceleration Tares				
Average Orifice Location, X/C = 0.020		Units: psi $\Delta\alpha = 5^\circ$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	0.006					
		1.	0.015	-0.015	-0.002	186.400
		2.	0.017	-0.011	-0.013	229.700
		3.	0.033	0.033	0.002	2.787
		4.	0.017	0.014	0.010	34.470
		5.	0.019	0.019	-0.001	356.700
		6.	0.017	0.013	0.011	39.320
		7.	0.005	0.003	0.004	51.700
		8.	0.033	0.013	-0.030	294.300
		9.	0.008	0.008	0.002	16.940
48.0	0.033					
		1.	0.140	-0.092	0.105	131.200
		2.	0.059	0.047	-0.036	323.100
		3.	0.016	0.015	0.007	24.330
		4.	0.082	0.058	0.059	45.590
		5.	0.027	0.025	0.007	16.130
		6.	0.017	-0.001	0.017	92.980
		7.	0.024	0.020	-0.012	328.100
		8.	0.015	0.015	0.003	11.570
		9.	0.019	0.012	-0.015	310.400
56.2	-0.003					
		1.	0.100	0.100	0.003	1.497
		2.	0.037	-0.033	-0.018	208.400
		3.	0.080	-0.059	-0.054	222.200
		4.	0.025	0.022	0.012	27.360
		5.	0.018	0.012	0.013	47.370
		6.	0.039	-0.015	0.036	112.700
		7.	0.012	-0.002	0.012	101.000
		8.	0.015	0.015	-0.003	349.400
		9.	0.006	-0.002	-0.006	253.300
71.8	0.015					
		1.	0.023	-0.020	-0.009	204.800
		2.	0.026	-0.025	0.004	170.400
		3.	0.038	-0.023	0.030	128.000
		4.	0.015	0.015	0.000	1.536
		5.	0.010	-0.009	-0.006	215.100
		6.	0.019	0.005	0.019	75.450
		7.	0.014	0.006	-0.013	244.400
		8.	0.005	-0.005	0.001	167.300
		9.	0.019	-0.007	0.014	111.100

TABLE C. ACCELERATION TARES

Transducer P03Acceleration TaresAverage Orifice
Location, X/C = 0.030Units: $\frac{1}{\Delta\alpha} = 5^\circ$ psi

F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.004	1.	0.001	-0.000	0.001	103.800
		2.	0.012	-0.009	-0.008	222.100
		3.	0.018	0.018	0.004	14.270
		4.	0.011	0.007	0.008	51.150
		5.	0.006	0.006	-0.000	357.400
		6.	0.007	-0.005	0.005	131.600
		7.	0.005	0.000	0.005	89.190
		8.	0.019	0.007	-0.017	293.700
		9.	0.004	0.004	-0.001	347.200
48.0	0.016	1.	0.082	-0.049	0.065	127.000
		2.	0.041	0.037	-0.018	333.700
		3.	0.013	0.013	0.001	4.407
		4.	0.049	0.037	0.033	41.760
		5.	0.006	0.006	0.000	4.220
		6.	0.005	0.005	-0.000	359.900
		7.	0.006	0.005	-0.004	322.500
		8.	0.020	0.020	-0.003	352.500
		9.	0.009	-0.009	0.000	177.800
56.2	-0.007	1.	0.055	0.055	0.007	6.933
		2.	0.022	-0.022	0.002	175.700
		3.	0.051	-0.043	-0.027	212.500
		4.	0.015	0.012	0.010	38.100
		5.	0.013	0.013	0.002	10.800
		6.	0.019	-0.013	0.014	132.800
		7.	0.008	-0.008	0.004	154.800
		8.	0.002	-0.002	-0.002	229.200
		9.	0.009	-0.006	-0.006	224.700
71.8	0.015	1.	0.028	-0.026	-0.010	201.900
		2.	0.016	-0.013	0.010	141.500
		3.	0.019	-0.007	0.018	111.000
		4.	0.009	0.007	-0.007	314.900
		5.	0.006	-0.001	-0.006	255.900
		6.	0.020	-0.018	0.007	158.600
		7.	0.007	-0.004	-0.005	230.100
		8.	0.002	-0.001	0.002	108.300
		9.	0.003	0.003	-0.002	322.600

TABLE D. ACCELERATION TARES

Transducer P04Acceleration TaresAverage Orifice
Location, X/C = 0.049Units: $\frac{1}{50}$ psi
 $\Delta\alpha = 5^\circ$

<u>F_D (Hz)</u>	<u>Steady</u>					
24.2	-0.015	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.014	-0.011	0.009	139,200
		2.	0.014	-0.013	-0.006	206,800
		3.	0.035	0.027	0.022	39,270
		4.	0.021	0.019	0.010	27,230
		5.	0.007	-0.006	-0.002	201,300
		6.	0.007	-0.007	0.001	169,300
		7.	0.012	0.002	0.012	82,090
		8.	0.032	0.004	-0.031	277,400
		9.	0.028	0.022	0.018	39,270
48.0	0.026	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.068	-0.057	0.037	147,400
		2.	0.065	0.017	-0.063	285,500
		3.	0.039	0.014	-0.037	290,900
		4.	0.061	0.045	0.042	43,490
		5.	0.023	0.021	0.011	27,500
		6.	0.027	0.020	0.019	44,010
		7.	0.005	0.005	-0.001	352,700
		8.	0.023	0.019	0.014	36,260
		9.	0.006	-0.003	0.006	115,300
56.2	-0.022	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.040	0.038	-0.013	341,200
		2.	0.034	-0.028	0.019	146,100
		3.	0.049	-0.035	-0.033	222,700
		4.	0.031	0.021	0.022	46,460
		5.	0.021	0.017	-0.012	323,900
		6.	0.012	-0.009	0.008	139,600
		7.	0.017	0.006	-0.015	297,900
		8.	0.045	0.042	-0.015	340,200
		9.	0.036	-0.027	-0.023	220,300
71.8	0.003	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.028	-0.028	-0.000	180,300
		2.	0.025	-0.024	-0.004	190,400
		3.	0.044	-0.030	0.032	133,900
		4.	0.018	-0.000	-0.018	269,900
		5.	0.031	0.011	-0.029	291,400
		6.	0.015	0.007	0.014	63,960
		7.	0.029	0.029	-0.004	352,900
		8.	0.016	-0.011	0.011	133,200
		9.	0.015	-0.012	0.009	141,900

TABLE E. ACCELERATION TARES

Transducer P05Acceleration TaresAverage Orifice
Location, X/C = 0.074Units: $\frac{\Delta a}{\Delta x} = 50$ psi

F_D (Hz)	Steady					
24.2	0.001	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.014	-0.014	0.000	179,500
		2.	0.018	-0.011	-0.014	231,900
		3.	0.025	0.025	0.006	13,700
		4.	0.014	0.011	0.009	39,390
		5.	0.006	0.006	-0.001	348,900
		6.	0.005	0.005	0.000	0,537
		7.	0.002	-0.000	0.002	96,190
		8.	0.019	0.003	-0.018	280,600
		9.	0.006	0.002	0.005	69,520
48.0	0.022	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.083	-0.052	0.065	128,700
		2.	0.032	0.026	-0.018	325,600
		3.	0.024	0.023	-0.007	343,400
		4.	0.056	0.037	0.042	48,350
		5.	0.010	0.010	0.003	17,740
		6.	0.015	0.015	0.003	10,420
		7.	0.007	0.006	0.002	21,120
		8.	0.012	0.012	-0.001	356,600
		9.	0.002	0.002	-0.002	310,200
56.2	0.005	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.048	0.047	0.011	12,920
		2.	0.022	-0.021	-0.007	197,600
		3.	0.049	-0.041	-0.027	213,800
		4.	0.033	0.028	0.018	33,090
		5.	0.010	0.010	0.002	13,080
		6.	0.011	-0.011	0.003	164,900
		7.	0.013	0.004	0.012	72,470
		8.	0.005	0.002	0.005	64,270
		9.	0.005	-0.005	0.000	177,500
71.8	0.005	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.028	-0.028	-0.002	183,200
		2.	0.022	-0.013	0.018	126,700
		3.	0.027	-0.019	0.020	133,100
		4.	0.011	0.011	-0.001	353,700
		5.	0.016	-0.004	-0.016	255,600
		6.	0.013	-0.011	0.006	145,100
		7.	0.012	-0.012	-0.001	164,000
		8.	0.006	0.006	-0.002	343,400
		9.	0.014	-0.014	-0.005	199,200

TABLE F. ACCELERATION TARES

Transducer P06		Acceleration Tares				
Average Orifice Location, X/C = 0.099		Units: psi $\Delta\alpha = 5^\circ$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.015					
		1,	0.001	-0.001	-0.000	199,400
		2,	0.020	-0.016	-0.012	216,800
		3,	0.020	0.018	0.007	22,140
		4,	0.014	0.013	0.005	18,590
		5,	0.007	0.007	-0.002	346,400
		6,	0.003	0.001	0.002	63,350
		7,	0.006	0.004	0.004	46,890
		8,	0.016	0.003	-0.015	282,600
		9,	0.005	0.005	0.001	13,040
48.0	0.015					
		1,	0.095	-0.058	0.075	127,900
		2,	0.033	0.029	-0.016	331,400
		3,	0.019	0.018	-0.006	340,600
		4,	0.059	0.039	0.044	48,500
		5,	0.009	0.003	0.009	67,920
		6,	0.002	0.001	0.001	22,240
		7,	0.009	0.005	0.008	60,790
		8,	0.017	0.017	0.004	12,700
		9,	0.010	-0.002	0.009	100,100
56.2	-0.016					
		1,	0.064	0.024	0.008	6,796
		2,	0.023	0.018	0.005	168,900
		3,	0.044	-0.011	-0.009	192,600
		4,	0.025	0.017	0.014	35,240
		5,	0.006	0.001	0.006	97,010
		6,	0.023	-0.011	0.020	119,800
		7,	0.011	-0.001	0.011	90,680
		8,	0.014	0.010	-0.004	342,700
		9,	0.009	-0.001	-0.000	182,500
71.8	-0.005					
		1,	0.022	-0.022	-0.001	183,300
		2,	0.008	-0.007	0.004	150,900
		3,	0.024	-0.017	0.017	134,000
		4,	0.011	0.010	-0.003	343,200
		5,	0.008	0.007	-0.004	332,600
		6,	0.015	-0.015	0.002	173,700
		7,	0.015	0.000	-0.015	271,500
		8,	0.009	-0.009	-0.001	187,100
		9,	0.009	0.005	0.007	52,100

TABLE G. ACCELERATION TARES

Transducer P07		Acceleration Tares				
Average Orifice Location, X/C = 0.149		Units: $\frac{\text{psi}}{\text{g}}$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.006	1.	0.009	-0.009	-0.001	167.100
		2.	0.014	-0.008	-0.011	234.300
		3.	0.018	0.016	0.009	28.720
		4.	0.010	0.007	0.008	47.920
		5.	0.005	0.005	0.000	0.597
		6.	0.005	0.004	0.004	46.650
		7.	0.013	0.000	0.013	89.290
		8.	0.017	0.001	-0.017	275.000
		9.	0.008	0.008	-0.001	350.300
48.0	-0.006	1.	0.096	-0.054	0.079	124.400
		2.	0.036	0.034	-0.012	340.100
		3.	0.015	0.014	-0.006	338.100
		4.	0.048	0.028	0.039	53.760
		5.	0.009	0.005	0.007	53.300
		6.	0.004	0.003	-0.002	328.900
		7.	0.010	0.007	0.007	44.290
		8.	0.012	0.011	0.005	25.630
		9.	0.003	0.002	-0.002	310.300
56.2	-0.023	1.	0.053	0.053	0.004	4.636
		2.	0.023	-0.022	-0.007	196.800
		3.	0.045	-0.041	-0.014	204.900
		4.	0.021	0.020	0.004	24.290
		5.	0.017	0.012	0.012	44.020
		6.	0.014	-0.009	0.011	128.500
		7.	0.010	0.001	0.010	86.810
		8.	0.009	-0.004	-0.002	194.200
		9.	0.004	0.000	0.004	64.880
71.8	-0.010	1.	0.036	-0.036	-0.006	275.000
		2.	0.013	-0.011	0.004	167.100
		3.	0.009	-0.007	0.006	28.720
		4.	0.005	0.004	0.003	47.920
		5.	0.013	-0.004	-0.012	234.300
		6.	0.017	-0.015	0.007	28.720
		7.	0.012	-0.012	-0.001	167.100
		8.	0.003	0.003	-0.001	350.300
		9.	0.007	-0.006	-0.003	208.700

TABLE H. ACCELERATION TARES

Transducer P08Acceleration TaresAverage Orifice
Location, X/C = 0.200Units: psi
 $\Delta t = 5^\circ$

<u>F_D (Hz)</u>	<u>Steady</u>					
24.2	0.005	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.008	-0.008	0.001	171.200
		2.	0.022	-0.016	-0.015	224.300
		3.	0.026	0.022	0.013	31.940
		4.	0.011	0.011	-0.002	349.500
		5.	0.023	0.023	0.003	8.500
		6.	0.019	0.009	0.017	61.110
		7.	0.021	0.021	0.005	14.870
		8.	0.024	0.002	-0.024	274.900
		9.	0.008	-0.002	-0.007	255.300
48.0	0.035	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.097	-0.046	0.085	118.400
		2.	0.052	0.049	-0.016	341.700
		3.	0.011	0.011	0.003	13.650
		4.	0.056	0.031	0.046	56.000
		5.	0.026	0.023	-0.014	329.000
		6.	0.010	0.010	-0.000	358.800
		7.	0.022	0.014	-0.017	309.300
		8.	0.022	0.020	-0.009	335.700
		9.	0.012	-0.007	-0.010	234.500
56.2	0.003	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.065	0.061	0.023	20.630
		2.	0.034	-0.013	-0.031	247.300
		3.	0.031	-0.029	-0.009	196.400
		4.	0.017	0.010	0.014	52.870
		5.	0.007	-0.004	0.000	129.100
		6.	0.018	-0.011	0.014	128.400
		7.	0.012	0.003	0.012	76.860
		8.	0.009	0.006	-0.007	307.900
		9.	0.009	0.007	-0.005	326.500
71.8	0.021	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.014	0.012	-0.007	329.300
		2.	0.005	-0.002	-0.005	248.500
		3.	0.010	-0.008	-0.007	220.400
		4.	0.012	-0.002	-0.012	259.100
		5.	0.016	-0.001	-0.016	264.900
		6.	0.009	0.008	0.004	24.430
		7.	0.013	0.009	0.010	49.630
		8.	0.009	-0.007	-0.006	223.300
		9.	0.023	-0.023	-0.006	194.400

TABLE I. ACCELERATION TARES

Transducer P09		Acceleration Tares				
Average Orifice Location, X/C = 0.250		Units: $\Delta a = 5^{\circ}$ psi				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.013					
		1.	0.003	-0.000	0.003	91.900
		2.	0.006	0.002	-0.006	288.000
		3.	0.013	-0.007	0.011	123.800
		4.	0.002	0.001	0.002	74.260
		5.	0.009	-0.007	0.006	140.100
		6.	0.002	0.001	-0.002	302.400
		7.	0.005	0.004	0.001	14.770
		8.	0.026	-0.025	0.007	163.800
		9.	0.005	-0.005	0.000	177.700
48.0	-0.012					
		1.	0.011	0.009	-0.006	325.200
		2.	0.004	0.004	-0.001	339.800
		3.	0.013	0.005	-0.012	294.400
		4.	0.134	-0.054	0.123	113.700
		5.	0.014	-0.003	0.014	104.300
		6.	0.015	-0.014	0.004	162.900
		7.	0.022	0.002	0.022	84.810
		8.	0.018	-0.018	-0.005	195.200
		9.	0.007	0.004	0.006	57.100
56.2	-0.008					
		1.	0.062	0.058	-0.021	340.200
		2.	0.015	-0.008	-0.012	235.200
		3.	0.031	0.007	-0.030	283.900
		4.	0.021	-0.002	0.021	45.290
		5.	0.012	0.006	0.010	61.990
		6.	0.007	-0.007	0.003	159.100
		7.	0.006	0.001	-0.006	283.100
		8.	0.021	0.011	0.018	58.920
		9.	0.004	-0.004	-0.001	198.700
71.8	-0.010					
		1.	0.038	0.027	-0.027	315.700
		2.	0.010	0.005	-0.008	301.400
		3.	0.006	0.002	0.006	71.420
		4.	0.013	-0.006	-0.012	243.700
		5.	0.006	-0.006	-0.003	205.100
		6.	0.015	0.015	0.004	13.400
		7.	0.014	0.013	-0.005	339.600
		8.	0.016	0.003	-0.015	281.800
		9.	0.003	-0.001	-0.003	255.100

TABLE J. ACCELERATION TARES

<u>Transducer P10</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.30		Units: $\frac{\text{psi}}{\Delta a} = 5^\circ$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	0.009	1.	0.003	0.002	0.002	54.370
		2.	0.002	0.002	0.002	43.490
		3.	0.004	-0.002	0.003	117.500
		4.	0.005	0.002	0.005	71.070
		5.	0.001	0.000	0.001	74.910
		6.	0.003	0.003	0.000	6.036
		7.	0.002	0.002	-0.001	543.300
		8.	0.021	-0.020	0.007	161.800
		9.	0.007	-0.006	-0.005	217.900
48.0	0.003	1.	0.007	0.003	-0.007	290.400
		2.	0.009	-0.005	-0.008	238.500
		3.	0.020	0.014	-0.015	313.500
		4.	0.112	-0.037	0.106	109.200
		5.	0.009	-0.006	0.007	131.200
		6.	0.015	-0.015	-0.005	197.600
		7.	0.017	0.004	0.017	77.210
		8.	0.013	-0.008	0.011	126.700
		9.	0.005	-0.002	0.005	117.000
56.2	0.004	1.	0.058	0.054	-0.021	338.700
		2.	0.008	-0.005	-0.006	233.800
		3.	0.025	0.002	-0.025	275.100
		4.	0.018	0.001	0.018	86.490
		5.	0.003	-0.001	0.002	104.500
		6.	0.008	0.003	0.007	66.440
		7.	0.001	0.000	0.001	83.700
		8.	0.014	0.006	0.013	67.410
		9.	0.008	-0.008	-0.002	193.800
71.8	0.002	1.	0.022	0.009	-0.020	294.100
		2.	0.007	-0.006	-0.004	217.900
		3.	0.011	0.010	0.003	16.150
		4.	0.012	-0.010	-0.005	204.500
		5.	0.007	-0.005	0.005	133.900
		6.	0.005	0.003	-0.004	311.400
		7.	0.007	0.007	-0.001	355.800
		8.	0.009	0.007	-0.007	314.100
		9.	0.003	0.002	0.002	39.810

TABLE K. ACCELERATION TARES

<u>Transducer P11</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C - 0.399		Units: ψ psi $\Delta\alpha = 5^\circ$				
F_D (Hz) Steady						
24.2 -0.021	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE	
	1.	0.014	-0.012	0.007	150.300	
	2.	0.008	0.008	-0.001	352.500	
	3.	0.006	-0.001	0.006	95.260	
	4.	0.008	-0.003	0.008	113.000	
	5.	0.008	-0.005	-0.006	234.400	
	6.	0.002	-0.002	0.000	174.200	
	7.	0.008	0.008	-0.003	339.100	
	8.	0.034	-0.033	0.004	173.200	
	9.	0.011	-0.005	-0.010	243.500	
48.0 -0.032	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE	
	1.	0.042	-0.041	-0.007	189.400	
	2.	0.011	0.003	0.011	75.020	
	3.	0.020	-0.001	-0.019	268.200	
	4.	0.157	-0.097	0.123	128.200	
	5.	0.015	-0.011	0.011	132.900	
	6.	0.013	-0.012	-0.005	202.400	
	7.	0.034	-0.004	0.034	96.200	
	8.	0.017	-0.007	0.015	114.200	
	9.	0.006	-0.005	0.004	143.500	
56.2 -0.021	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE	
	1.	0.034	0.019	-0.028	304.100	
	2.	0.004	0.004	0.001	12.130	
	3.	0.029	0.000	-0.029	270.700	
	4.	0.019	-0.008	0.017	113.600	
	5.	0.012	-0.003	0.011	104.400	
	6.	0.019	-0.012	0.015	28.700	
	7.	0.007	-0.005	-0.006	228.800	
	8.	0.032	-0.002	0.032	94.270	
	9.	0.005	0.001	-0.005	276.400	
71.8 -0.028	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE	
	1.	0.080	-0.067	-0.043	212.600	
	2.	0.028	0.025	-0.011	336.200	
	3.	0.026	0.019	0.018	42.970	
	4.	0.018	-0.017	-0.006	198.600	
	5.	0.024	0.007	0.023	72.010	
	6.	0.022	0.011	0.019	60.560	
	7.	0.013	0.013	0.003	15.200	
	8.	0.001	-0.001	-0.001	217.000	
	9.	0.006	-0.006	-0.001	192.600	

TABLE L. ACCELERATION TARES

<u>Transducer Pl2</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.501		Units: $\frac{\text{psi}}{\Delta\alpha = 5^\circ}$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.010					
		1.	0.002	-0.000	0.002	100.500
		2.	0.005	0.005	0.002	27.030
		3.	0.005	-0.005	0.002	158.800
		4.	0.008	-0.000	0.008	90.490
		5.	0.002	0.001	0.001	40.530
		6.	0.003	0.003	0.000	4.264
		7.	0.001	0.000	-0.001	261.600
		8.	0.020	-0.020	0.003	171.400
		9.	0.009	-0.007	-0.005	216.100
48.0	-0.014					
		1.	0.017	0.017	0.005	16.380
		2.	0.007	-0.004	-0.005	233.300
		3.	0.020	0.020	0.003	7.381
		4.	0.127	-0.074	0.103	125.700
		5.	0.010	-0.010	-0.002	191.500
		6.	0.012	-0.012	-0.006	181.200
		7.	0.021	-0.007	0.020	109.900
		8.	0.007	-0.005	0.004	141.000
		9.	0.013	-0.010	0.009	137.900
56.2	-0.008					
		1.	0.084	0.084	0.002	1.264
		2.	0.018	-0.007	-0.017	246.200
		3.	0.038	0.032	-0.022	325.500
		4.	0.025	-0.016	0.019	131.000
		5.	0.006	-0.004	0.004	129.400
		6.	0.012	-0.011	0.004	160.100
		7.	0.002	-0.001	-0.001	224.300
		8.	0.014	-0.000	0.014	90.100
		9.	0.002	-0.001	-0.002	235.500
71.8	-0.009					
		1.	0.054	0.052	-0.014	345.000
		2.	0.023	-0.019	-0.014	216.100
		3.	0.008	0.003	-0.008	288.100
		4.	0.004	0.004	-0.002	338.200
		5.	0.012	-0.009	0.009	133.800
		6.	0.007	0.005	0.005	41.570
		7.	0.012	0.012	-0.001	353.400
		8.	0.010	0.010	-0.002	349.000
		9.	0.008	0.008	0.000	1.885

TABLE M. ACCELERATION TARES

Transducer P13		Acceleration Tares				
Average Orifice Location, X/C = 0.600		Units: psi $\Delta\alpha = 5^\circ$				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.027	1.	0.006	0.005	-0.003	327.700
		2.	0.011	0.009	0.006	35.410
		3.	0.008	-0.006	0.006	134.300
		4.	0.021	0.002	0.021	85.310
		5.	0.007	-0.007	0.001	162.600
		6.	0.006	0.003	0.005	54.360
		7.	0.004	0.002	0.004	65.530
		8.	0.015	-0.015	0.003	167.900
		9.	0.006	-0.006	-0.003	210.600
48.0	-0.043	1.	0.019	0.014	-0.013	317.200
		2.	0.013	-0.002	-0.012	259.200
		3.	0.031	0.020	-0.024	310.700
		4.	0.145	-0.081	0.120	124.100
		5.	0.017	-0.014	0.010	144.900
		6.	0.020	-0.011	0.017	122.100
		7.	0.019	0.001	0.019	87.420
		8.	0.010	0.009	0.003	15.860
		9.	0.013	0.002	0.013	82.000
56.2	-0.023	1.	0.063	0.063	-0.001	359.000
		2.	0.015	-0.015	0.002	171.300
		3.	0.041	0.017	-0.037	294.100
		4.	0.036	-0.013	0.033	110.700
		5.	0.030	0.007	0.029	77.050
		6.	0.015	-0.006	0.014	112.400
		7.	0.016	-0.002	-0.016	263.200
		8.	0.029	-0.001	0.029	91.750
		9.	0.011	0.002	-0.011	278.600
71.8	-0.017	1.	0.062	0.050	-0.037	323.200
		2.	0.006	0.006	0.000	0.290
		3.	0.014	0.004	-0.013	286.000
		4.	0.010	-0.010	0.001	173.400
		5.	0.013	0.003	0.013	74.960
		6.	0.017	0.007	0.016	66.430
		7.	0.017	0.015	0.007	24.740
		8.	0.013	0.012	-0.004	340.400
		9.	0.010	-0.010	0.001	176.600

REPRODUCTION OF
ORIGINAL DATA

TABLE N. ACCELERATION TARES

<u>Transducer P14</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.701		Units: $\frac{\Delta\alpha}{\Delta\alpha} = 5^\circ$ psi				
<u>F_D (Hz)</u>	<u>Steady</u>	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.001	1.	0.007	0.006	-0.002	343.700
		2.	0.011	0.010	-0.003	342.500
		3.	0.011	-0.010	0.004	156.100
		4.	0.002	-0.002	0.001	159.500
		5.	0.009	-0.006	-0.007	232.800
		6.	0.002	-0.002	-0.001	191.700
		7.	0.008	-0.006	0.004	144.000
		8.	0.023	-0.023	0.005	166.800
		9.	0.010	-0.008	-0.006	219.500
48.0	-0.010	1.	0.017	0.016	-0.006	338.100
		2.	0.004	-0.003	-0.002	208.800
		3.	0.020	0.017	-0.011	328.200
		4.	0.126	-0.071	0.104	124.500
		5.	0.009	-0.005	0.007	125.600
		6.	0.007	-0.005	0.004	142.800
		7.	0.023	-0.001	0.023	92.790
		8.	0.010	0.004	0.009	67.950
		9.	0.005	-0.003	0.004	122.900
56.2	-0.009	1.	0.083	0.082	-0.016	348.700
		2.	0.011	0.001	-0.011	273.600
		3.	0.024	0.014	-0.019	306.000
		4.	0.024	-0.006	0.023	104.200
		5.	0.010	0.005	-0.009	297.000
		6.	0.012	-0.007	0.010	127.600
		7.	0.012	-0.008	-0.010	230.900
		8.	0.019	0.002	0.019	85.230
		9.	0.011	-0.002	-0.011	260.500
71.8	-0.001	1.	0.036	0.029	-0.022	322.500
		2.	0.014	-0.013	-0.006	206.000
		3.	0.010	0.008	0.007	41.450
		4.	0.016	-0.012	0.011	136.800
		5.	0.006	-0.005	0.002	155.500
		6.	0.008	-0.001	0.008	48.180
		7.	0.002	0.002	0.001	24.940
		8.	0.003	0.002	-0.002	314.500
		9.	0.004	-0.002	-0.004	238.000

TABLE O. ACCELERATION TARES

<u>Transducer P15</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.800		Units: $\Delta\alpha = 5^\circ$ psi				
F_D (Hz)	Steady	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.015					
		1.	0.004	0.003	0.002	27.100
		2.	0.004	0.004	-0.001	338.600
		3.	0.005	-0.003	0.005	120.700
		4.	0.008	-0.001	0.008	98.990
		5.	0.001	-0.001	-0.000	165.500
		6.	0.004	0.003	-0.002	323.800
		7.	0.004	-0.002	-0.004	238.400
		8.	0.023	-0.022	0.004	169.300
		9.	0.003	-0.003	0.000	179.000
48.0	-0.020					
		1.	0.015	0.014	0.005	19.790
		2.	0.010	-0.004	-0.009	246.400
		3.	0.021	0.019	-0.010	332.100
		4.	0.132	-0.074	0.109	124.100
		5.	0.017	-0.017	-0.004	192.800
		6.	0.017	-0.010	0.014	125.800
		7.	0.026	0.000	0.026	89.040
		8.	0.020	0.018	0.008	22.470
		9.	0.007	0.004	0.005	55.960
56.2	-0.006					
		1.	0.095	0.093	-0.016	350.100
		2.	0.010	-0.003	-0.010	250.900
		3.	0.053	0.034	-0.040	310.600
		4.	0.014	-0.008	0.012	121.900
		5.	0.003	0.003	0.001	12.900
		6.	0.013	-0.007	0.011	123.300
		7.	0.013	0.011	-0.006	332.200
		8.	0.025	-0.001	0.025	92.210
		9.	0.012	-0.003	-0.012	254.500
71.8	-0.006					
		1.	0.045	0.045	-0.004	354.900
		2.	0.014	-0.014	-0.001	165.000
		3.	0.015	0.015	0.002	8.229
		4.	0.006	0.003	0.005	57.400
		5.	0.009	0.003	0.009	71.260
		6.	0.026	0.018	0.019	47.650
		7.	0.002	0.002	0.001	29.250
		8.	0.004	0.001	-0.003	293.900
		9.	0.020	-0.014	0.015	134.200

TABLE P. ACCELERATION TARES

<u>Transducer Pl6</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.900		Units: ψ psi $\Delta\alpha = 5^\circ$				
<u>F_D (Hz)</u>	<u>Steady</u>	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
24.2	-0.008	1.	0.001	-0.001	0.001	120.200
		2.	0.008	0.007	-0.004	329.700
		3.	0.009	-0.009	-0.003	194.400
		4.	0.013	-0.004	0.012	110.300
		5.	0.002	0.002	-0.001	336.400
		6.	0.001	0.001	-0.000	336.900
		7.	0.004	0.001	0.003	76.419
		8.	0.025	-0.025	-0.003	186.300
		9.	0.002	0.000	-0.002	273.500
48.0	-0.021	1.	0.004	0.008	0.005	31.290
		2.	0.013	-0.013	0.001	176.500
		3.	0.016	0.012	-0.010	320.500
		4.	0.147	-0.076	0.126	121.000
		5.	0.016	-0.009	0.014	122.100
		6.	0.012	-0.007	0.010	123.600
		7.	0.033	-0.008	0.032	104.300
		8.	0.017	0.017	-0.003	349.200
		9.	0.021	-0.002	0.021	95.420
56.2	-0.014	1.	0.092	0.092	-0.005	357.000
		2.	0.014	-0.011	-0.009	220.300
		3.	0.032	0.014	-0.029	296.300
		4.	0.037	-0.010	0.036	106.200
		5.	0.020	-0.018	0.008	155.400
		6.	0.014	0.009	0.011	50.220
		7.	0.012	-0.010	-0.006	213.000
		8.	0.010	-0.000	0.010	92.000
		9.	0.013	-0.013	0.001	177.200
71.8	-0.022	1.	0.040	0.029	-0.027	316.500
		2.	0.017	-0.014	-0.009	212.600
		3.	0.011	0.006	-0.010	301.300
		4.	0.009	0.004	0.002	13.030
		5.	0.023	-0.007	0.022	108.500
		6.	0.009	0.002	0.004	76.120
		7.	0.007	0.007	-0.002	346.400
		8.	0.004	0.006	0.003	14.000
		9.	0.004	0.002	0.003	54.330

TABLE Q. ACCELERATION TARES

<u>Transducer P17</u>		<u>Acceleration Tares</u>				
Average Orifice Location, X/C = 0.969		Units: $\frac{\text{psi}}{\Delta\alpha} = 5^\circ$				
<u>F_D (Hz)</u>	<u>Steady</u>					
24.2	-0.029	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.003	0.003	-0.001	333.200
		2.	0.007	0.007	0.000	1.962
		3.	0.003	-0.001	0.003	120.000
		4.	0.007	0.006	0.002	15.880
		5.	0.008	0.002	-0.008	284.300
		6.	0.004	-0.002	-0.003	231.800
		7.	0.004	0.004	-0.000	356.300
		8.	0.020	-0.019	-0.008	203.200
		9.	0.014	-0.012	-0.007	212.400
48.0	-0.037	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.011	0.010	-0.005	332.000
		2.	0.008	-0.004	0.007	120.700
		3.	0.005	0.004	-0.003	322.900
		4.	0.134	-0.083	0.106	128.200
		5.	0.020	-0.020	0.004	169.600
		6.	0.018	-0.013	-0.013	224.800
		7.	0.024	0.001	0.024	86.870
		8.	0.012	-0.001	0.012	47.090
		9.	0.014	-0.002	0.014	49.720
56.2	-0.045	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.066	0.064	-0.016	346.300
		2.	0.007	-0.005	-0.005	225.900
		3.	0.027	0.014	-0.024	299.600
		4.	0.017	-0.005	0.016	107.300
		5.	0.008	0.001	0.008	80.530
		6.	0.010	-0.006	0.006	140.200
		7.	0.005	0.005	-0.000	358.300
		8.	0.021	-0.013	0.016	128.000
		9.	0.014	-0.010	-0.009	223.700
71.8	-0.024	HARM	RESULTANT	SINE COEFF	COS COEFF	PHASE
		1.	0.036	0.015	-0.032	245.700
		2.	0.011	-0.007	-0.009	232.600
		3.	0.019	0.004	0.019	17.000
		4.	0.019	-0.005	-0.019	255.800
		5.	0.002	-0.000	-0.002	265.600
		6.	0.038	0.037	0.010	15.300
		7.	0.011	-0.008	-0.007	219.800
		8.	0.015	0.002	-0.014	277.100
		9.	0.020	-0.005	0.019	104.900

FORCED PITCHING OSCILLATION											
AIRFOIL				ACCELERATION TABLES							
DEL-ALPHA		DEL-M		ALPHA-0		TEST POINT		CYCLES ANALYSED			
5.93		0.0		10.00		12007.5		20			
HARMONIC ANALYSIS				AERO DAMP		TOR		EXT DAMP			
1.609				-0.00161		0.004		0.0			
HARMONIC ANALYSIS											
RES 0		RES 1 PHI		RES 2 PHI		RES 3 PHI		RES 4 PHI		RES 5 PHI	
RES 6 PHI		RES 7 PHI		RES 8 PHI		RES 9 PHI		RES 0		RES 1 PHI	
UNFO MZ	0.0	5.927	0	0.500	0.156	0.087	0.043	0.018	0.000	0.020	0.005
DRIVE MZ	30.15	0.385	37	0.066	0.022	0.009	0.004	0.014	0.000	0.003	0.000
DEL-ALPHA	0.199	0.004	200	0.013	0.008	0.005	0.004	0.009	0.002	0.001	0.003
DEL-M	0.0	1.924	348	0.279	0.149	0.082	0.043	0.023	0.012	0.009	0.005
DEL-ALPHA	0.199	1.804	358	0.189	0.102	0.055	0.028	0.014	0.007	0.004	0.002
DEL-M	0.0	1.596	358	0.153	0.081	0.043	0.022	0.011	0.006	0.003	0.002
DEL-ALPHA	0.199	1.339	1	0.140	0.069	0.038	0.022	0.013	0.007	0.004	0.002
DEL-M	0.0	1.033	5	0.099	0.049	0.024	0.013	0.007	0.004	0.002	0.001
DEL-ALPHA	0.199	0.875	10	0.093	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-M	0.0	0.679	17	0.089	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-ALPHA	0.199	0.566	26	0.084	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-M	0.0	0.457	29	0.075	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-ALPHA	0.199	0.370	36	0.069	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-M	0.0	0.304	63	0.074	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-ALPHA	0.199	0.249	73	0.071	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-M	0.0	0.200	83	0.071	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-ALPHA	0.199	0.153	98	0.056	0.043	0.022	0.013	0.007	0.004	0.002	0.001
DEL-M	0.0	0.100	111	0.042	0.043	0.022	0.013	0.007	0.004	0.002	0.001

FORCED PITCHING OSCILLATION										ACCELERATION TABLES									
		AIRFOIL				WLR 1				CYCLES ANALYSED									
		DEL-ALPHA		DEL-M		ALPHA-0		TEST POINT		CYCLES ANALYSED									
		5.90		0.0		12.52		12007.0		20									
		CHARGE1		ALPHA-MAX		AERO DAMP		TOR		EXT DAMP									
		1.595		10.59		-0.00123		0.739		0.0									
HARMONIC ANALYSIS																			
DATA	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI								
UNFO MZ	0.0	5.902	0	0.496	0.151	0.087	0.043	0.019	0.004	0.024	0.011	1.3	0.005						
DRIVE MZ	67.57	0.381	33	0.059	0.016	0.011	0.006	0.007	0.009	0.011	0.005	261	0.004						
DEL-ALPHA	0.199	0.055	291	0.017	0.005	0.003	0.003	0.001	0.002	0.002	0.000	125	0.001						
DEL-M	0.0	1.501	359	0.484	0.216	0.121	0.063	0.031	0.017	0.015	0.009	209	0.001						
DEL-ALPHA	0.199	1.310	1	0.304	0.140	0.080	0.043	0.023	0.013	0.009	0.005	30	0.002						
DEL-M	0.0	1.017	8	0.202	0.093	0.052	0.028	0.014	0.007	0.004	0.002	131	0.001						
DEL-ALPHA	0.199	0.812	10	0.174	0.084	0.049	0.026	0.013	0.007	0.004	0.002	176	0.000						
DEL-M	0.0	0.612	12	0.149	0.071	0.040	0.022	0.011	0.006	0.003	0.002	209	0.000						
DEL-ALPHA	0.199	0.462	14	0.118	0.052	0.031	0.016	0.008	0.004	0.002	0.001	82	0.000						
DEL-M	0.0	0.320	23	0.106	0.043	0.026	0.013	0.007	0.004	0.002	0.001	130	0.000						
DEL-ALPHA	0.199	0.249	29	0.099	0.038	0.022	0.013	0.007	0.004	0.002	0.001	116	0.000						
DEL-M	0.0	0.200	36	0.089	0.033	0.020	0.013	0.007	0.004	0.002	0.001	111	0.000						
DEL-ALPHA	0.199	0.153	40	0.074	0.028	0.016	0.010	0.006	0.003	0.002	0.001	137	0.000						
DEL-M	0.0	0.100	54	0.054	0.020	0.011	0.006	0.003	0.002	0.001	0.000	129	0.000						
DEL-ALPHA	0.199	0.074	60	0.048	0.016	0.008	0.004	0.002	0.001	0.000	0.000	93	0.000						
DEL-M	0.0	0.057	70	0.040	0.011	0.006	0.003	0.002	0.001	0.000	0.000	24	0.000						
DEL-ALPHA	0.199	0.040	80	0.034	0.008	0.004	0.002	0.001	0.000	0.000	0.000	231	0.000						
DEL-M	0.0	0.030	90	0.026	0.006	0.003	0.002	0.001	0.000	0.000	0.000	162	0.000						
DEL-ALPHA	0.199	0.020	100	0.019	0.004	0.002	0.001	0.000	0.000	0.000	0.000	104	0.000						

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED PITCHING OSCILLATION										ACCELERATION TABLE									
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-ALPHA	DEL-ALPHA	DEL-ALPHA	DEL-ALPHA	DEL-ALPHA	ALPHA-0	TEST POINT	CYCLES ANALYSED	EXT DAMP	EXT DAMP	EXT DAMP	EXT DAMP	EXT DAMP	EXT DAMP	EXT DAMP
U.O	68.82	0.520	0.198	5.93	0.0	0.0	0.0	0.0	0.0	19.97	12007.9	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DATA TYPE	X/C	RES 0	RES 1	RES 2	RES 3	RES 4	RES 5	RES 6	RES 7	RES 8	RES 9	RES 10	RES 11	RES 12	RES 13	RES 14	RES 15	RES 16	RES 17
ALPHA	0.010	5.931	0	7.532	0.100	0.210	0.045	0.015	0.018	0.019	0.019	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
CM	0.010	0.659	0	0.056	0.033	0.337	0.032	0.174	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
DCP 1	0.010	0.115	73	0.059	0.020	0.174	0.013	0.32	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009	0.009
DCP 2	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 3	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 4	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 5	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 6	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 7	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 8	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 9	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 10	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 11	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 12	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 13	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 14	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 15	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 16	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179
DCP 17	0.010	0.621	0	0.619	0.230	0.323	0.132	0.358	0.236	0.26	0.163	0.356	0.135	0.282	0.151	0.245	0.127	0.179	0.179

FORCED PITCHING OSCILLATION				AIRFOIL				ACCELERATION TABLE			
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	TEST POINT	CYCLES ANALYSED	EXT DAMP
U.U	23.16	0.115	0.302	5.15	0.0	5.01	12009.3	20	0.0	0.0	0.0
V	27617.7	0.46E 07	0.001 284	1.009	9.80	-0.00094	0.780	0.0	0.0	0.0	0.0
102.9	(337.7)										
DATA TYPE	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	RES 10 PHI	RES 11 PHI
ALPHA	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
CN	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
CM	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 2	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 3	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 4	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 5	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 6	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 7	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 8	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 9	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 10	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 11	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 12	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 13	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 14	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 15	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 16	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 17	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005

FORCED PITCHING OSCILLATION				AIRFOIL				ACCELERATION TABLE			
TUNED MZ	DRIVE MZ	K	MACH NO	DEL-ALPHA	DEL-M	ALPHA-0	TEST POINT	CYCLES ANALYSED	TEST POINT	CYCLES ANALYSED	EXT DAMP
U.U	23.16	0.115	0.302	5.15	0.0	5.01	12009.3	20	0.0	0.0	0.0
V	27273.6	0.46E 07	0.001 284	1.009	9.80	-0.00094	0.780	0.0	0.0	0.0	0.0
102.1	(335.1)										
DATA TYPE	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI	RES 10 PHI	RES 11 PHI
ALPHA	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
CN	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
CM	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 2	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 3	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 4	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 5	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 6	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 7	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 8	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 9	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 10	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 11	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 12	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 13	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 14	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 15	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 16	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
DCP 17	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

FORCED	PITCHING	OSSILLATION	AIRFOIL	NLR	ACCELERATION TARGETS
DRIVE M2	K	WACH NO	DEL-ALPHA	DEL-M	ALPHA-0
					TEST POINT
					CYCLES ANALYSED

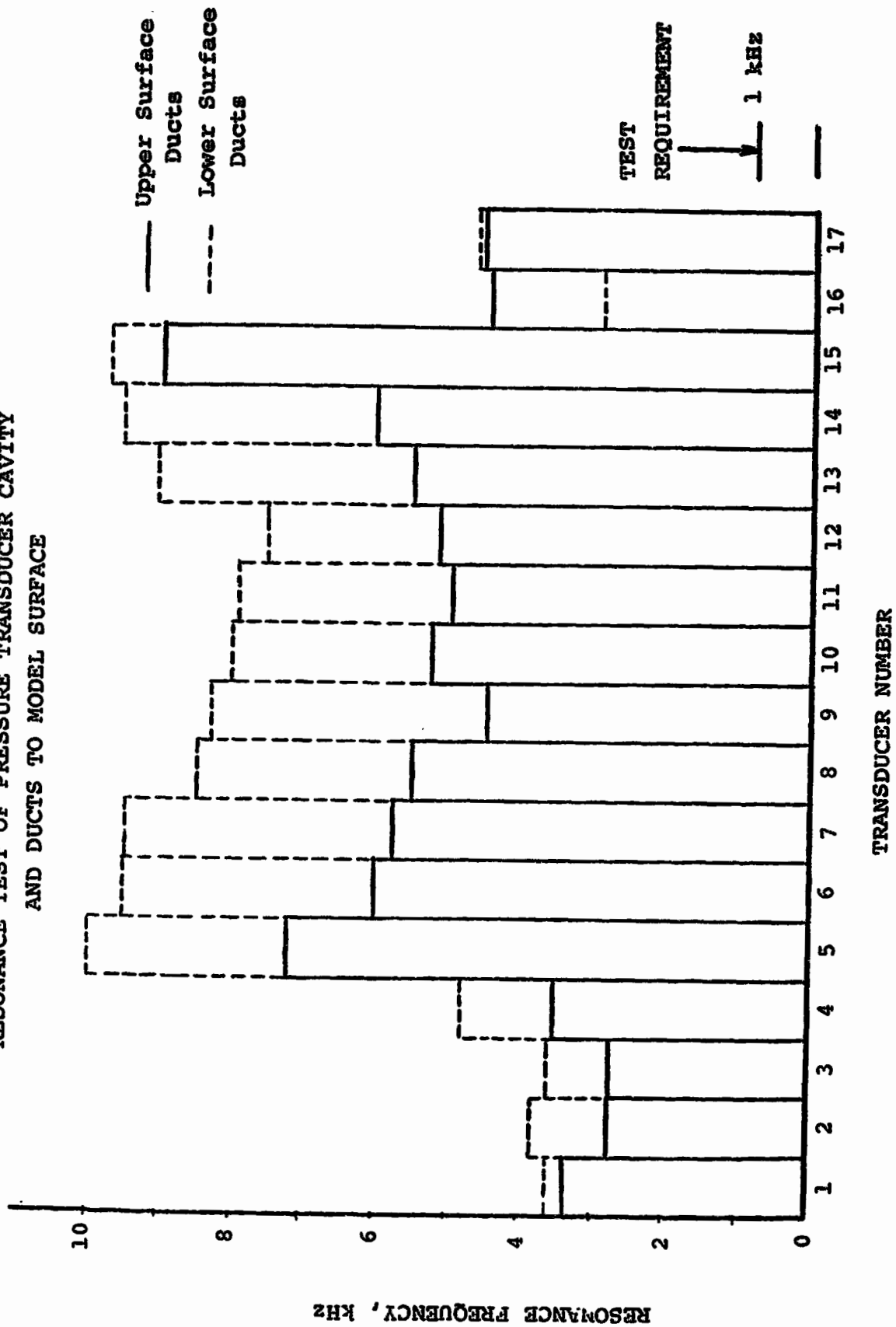
DATA TYPE	FORCED				PITCHING				OSCILLATION				AIRFOIL				NLR 1				ACCELERATION TABLES			
	TUNED MZ		DRIVE MZ		K	R		RN	CYR(MIN)		WACM MD	DEL ALPHA		DEL M	ALPHA,0		ALPHA,0	TEST POINT		CYCLES ANALYSED				
	0.0	23.26	23.26	0.117		0.40E 07	-0.095		5.12	5.12		0.300	0.300		0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0
V	101.2	26875.	26875.	26875.	0.40E 07	-0.095	5.12	5.12	0.300	0.300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
W/C	1.5	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
DEC 1	0.010	4.406	1.172	23	1.153	38	0.619	315	0.396	263	0.315	179	0.208	109	0.113	28	0.056	285	0.078	185				
DEC 2	0.020	3.521	0.920	29	1.022	45	0.610	320	0.366	236	0.238	166	0.168	102	0.126	48	0.065	395	0.071	302				
DEC 3	0.030	3.143	0.757	41	0.989	38	0.561	305	0.257	211	0.189	161	0.107	140	0.106	61	0.118	333	0.090	256				
DEC 4	0.040	3.074	1.076	12	0.583	16	0.135	283	0.076	173	0.048	70	0.036	350	0.015	273	0.010	161	0.004	33				
DEC 5	0.050	2.815	1.5	0.341	15	0.128	275	0.074	163	0.041	53	0.033	324	0.021	216	0.021	133	0.010	16					
DEC 6	0.060	2.296	0.619	20	0.321	15	0.125	269	0.080	133	0.045	44	0.033	314	0.021	210	0.016	119	0.007	333				
DEC 7	0.070	1.710	0.523	24	0.227	2	0.116	243	0.062	133	0.036	21	0.020	298	0.005	214	0.012	145	0.004	292				
DEC 8	0.080	1.450	0.360	23	0.227	339	0.118	211	0.093	94	0.099	357	0.039	277	0.023	204	0.025	120	0.009	347				
DEC 9	0.090	1.274	0.348	19	0.215	313	0.118	178	0.103	74	0.261	352	0.043	281	0.052	191	0.039	100	0.033	14				
DEC 10	0.100	1.138	0.302	17	0.194	300	0.131	170	0.095	49	0.084	356	0.063	274	0.064	179	0.034	77	0.032	27				
DEC 11	0.110	0.943	0.413	20	0.145	292	0.145	156	0.080	44	0.049	326	0.068	259	0.060	159	0.029	55	0.030	329				
DEC 12	0.120	0.687	0.303	73	0.093	281	0.102	131	0.075	16	0.350	284	0.034	204	0.034	127	0.025	33	0.026	313				
DEC 13	0.130	0.546	0.229	29	0.070	271	0.088	114	0.063	347	0.048	257	0.034	175	0.063	89	0.018	27	0.022	499				
DEC 14	0.140	0.457	0.173	19	0.050	257	0.073	105	0.064	329	0.324	231	0.015	158	0.074	93	0.015	394	0.028	479				
DEC 15	0.150	0.268	0.119	29	0.061	232	0.064	93	0.064	318	0.013	202	0.004	167	0.009	116	0.010	14	0.008	231				
DEC 16	0.160	0.116	0.085	1	0.045	210	0.021	87	0.020	308	0.016	222	0.017	123	0.010	6	0.003	302	0.008	231				
DEC 17	0.170	0.032	0.036	349	0.026	219	0.019	64	0.012	290	0.006	161	0.006	120	0.008	25	0.005	65	0.005	217				

ACCELERATION TABLES									
FORCED PITCHING OSCILLATION				AIRFOIL		ACCELERATION TABLES			
TUNED MZ	DRIVE MZ	K	NACH N7	DEL ALPHA	DEL M	ALPHA.0	TEST POINT	CYCLES ANALYSED	
0.0	23.22	0.117	0.299	5.06	0.0	12.48	12009.6	20	
V	Q	RA	CHIMIN)	CHIMAX)	ALPHA.MNAX	AERO DAMP	TDR	EXT DAMP	
100.8	26732.	0.48E 07	-0.103	1.697	10.00	-0.0106	0.070	0.0	
(330.8)	(558.3)								
HARMONIC ANALYSIS									
DATA	X/C	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI
ALPHA									
CM									
DCP 1	0.013	0.776 143	1.356 81	0.732 39	0.422 357	0.239 333	0.152 341	0.200 307	0.102 294
DCP 2	0.020	0.606 134	1.171 79	0.497 31	0.259 359	0.167 326	0.045 326	0.149 305	0.060 217
DCP 3	0.030	0.302 135	0.664 69	0.250 25	0.234 39	0.406 360	0.043 319	0.136 298	0.098 242
DCP 4	0.040	0.145 136	0.302 70	0.125 21	0.104 311	0.105 260	0.012 205	0.036 298	0.115 255
DCP 5	0.050	0.074 137	0.151 71	0.062 11	0.056 312	0.056 210	0.008 150	0.027 150	0.049 98
DCP 6	0.060	0.044 138	0.096 72	0.037 12	0.037 313	0.037 211	0.004 149	0.027 111	0.036 64
DCP 7	0.070	0.027 139	0.051 73	0.021 13	0.021 314	0.021 212	0.002 150	0.027 111	0.036 64
DCP 8	0.080	0.016 140	0.027 74	0.011 14	0.011 315	0.011 213	0.001 151	0.027 111	0.036 64
DCP 9	0.090	0.009 141	0.014 75	0.006 15	0.006 316	0.006 214	0.001 152	0.027 111	0.036 64
DCP 10	0.100	0.005 142	0.009 76	0.004 16	0.004 317	0.004 215	0.001 153	0.027 111	0.036 64
DCP 11	0.110	0.003 143	0.006 77	0.002 17	0.002 318	0.002 216	0.001 154	0.027 111	0.036 64
DCP 12	0.120	0.002 144	0.004 78	0.001 18	0.001 319	0.001 217	0.001 155	0.027 111	0.036 64
DCP 13	0.130	0.001 145	0.003 79	0.001 19	0.001 320	0.001 218	0.001 156	0.027 111	0.036 64
DCP 14	0.140	0.001 146	0.002 80	0.001 20	0.001 321	0.001 219	0.001 157	0.027 111	0.036 64
DCP 15	0.150	0.001 147	0.001 81	0.001 21	0.001 322	0.001 220	0.001 158	0.027 111	0.036 64
DCP 16	0.160	0.001 148	0.001 82	0.001 22	0.001 323	0.001 221	0.001 159	0.027 111	0.036 64
DCP 17	0.170	0.001 149	0.001 83	0.001 23	0.001 324	0.001 222	0.001 160	0.027 111	0.036 64

ACCELERATION TABLES									
FORCED PITCHING OSCILLATION				AIRFOIL		ACCELERATION TABLES			
TUNED MZ	DRIVE MZ	K	NACH N7	DEL ALPHA	DEL M	ALPHA.0	TEST POINT	CYCLES ANALYSED	
0.0	23.24	0.110	0.298	5.05	0.0	15.04	12009.7	20	
V	Q	RA	CHIMIN)	CHIMAX)	ALPHA.MNAX	AERO DAMP	TDR	EXT DAMP	
100.6	26660.	0.40E 07	-0.218	1.626	17.82	-0.00164	1.332	0.0	
(330.0)	(556.8)								
HARMONIC ANALYSIS									
DATA	X/C	RES 1 PMI	RES 2 PMI	RES 3 PMI	RES 4 PMI	RES 5 PMI	RES 6 PMI	RES 7 PMI	RES 8 PMI
ALPHA									
CM									
DCP 1	0.013	0.993 159	0.990 110	0.534 124	0.411 124	0.204 114	0.177 154	0.163 134	0.077 119
DCP 2	0.020	0.342 155	0.717 102	0.400 124	0.225 115	0.134 107	0.104 152	0.138 134	0.089 110
DCP 3	0.030	0.183 156	0.417 94	0.247 138	0.165 114	0.112 134	0.091 152	0.104 134	0.077 119
DCP 4	0.040	0.082 157	0.204 130	0.129 81	0.149 91	0.122 117	0.090 144	0.101 133	0.070 106
DCP 5	0.050	0.044 158	0.104 83	0.065 64	0.117 54	0.087 144	0.055 137	0.051 101	0.021 101
DCP 6	0.060	0.027 159	0.051 70	0.035 55	0.115 21	0.084 137	0.039 129	0.057 101	0.019 112
DCP 7	0.070	0.016 160	0.026 55	0.017 41	0.101 8	0.094 131	0.043 124	0.057 101	0.019 112
DCP 8	0.080	0.009 161	0.014 56	0.009 35	0.121 6	0.127 133	0.043 124	0.057 101	0.019 112
DCP 9	0.090	0.006 162	0.009 57	0.006 36	0.133 56	0.140 116	0.043 124	0.057 101	0.019 112
DCP 10	0.100	0.004 163	0.007 58	0.004 37	0.145 57	0.156 117	0.043 124	0.057 101	0.019 112
DCP 11	0.110	0.003 164	0.005 59	0.003 38	0.157 58	0.167 118	0.043 124	0.057 101	0.019 112
DCP 12	0.120	0.002 165	0.004 60	0.002 39	0.169 59	0.178 119	0.043 124	0.057 101	0.019 112
DCP 13	0.130	0.001 166	0.003 61	0.001 40	0.181 60	0.189 120	0.043 124	0.057 101	0.019 112
DCP 14	0.140	0.001 167	0.002 62	0.001 41	0.193 61	0.200 121	0.043 124	0.057 101	0.019 112
DCP 15	0.150	0.001 168	0.001 63	0.001 42	0.205 62	0.211 122	0.043 124	0.057 101	0.019 112
DCP 16	0.160	0.001 169	0.001 64	0.001 43	0.217 63	0.222 123	0.043 124	0.057 101	0.019 112
DCP 17	0.170	0.001 170	0.001 65	0.001 44	0.229 64	0.233 124	0.043 124	0.057 101	0.019 112

REPRODUCIBILITY OF THE
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RESONANCE TEST OF PRESSURE TRANSDUCER CAVITY AND DUCTS TO MODEL SURFACE



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16. Abstract A two-dimensional wind tunnel test was conducted to obtain the quasi-steady and unsteady characteristics of the NLR 7223-62, an advanced airfoil designed for helicopter rotor applications. Differential pressures were measured at 17 locations along the chord of the airfoil model. The airfoil motion were sinusoidal forced pitch oscillations about the quarter chord at amplitudes varying from 2.5° to 10.0° and at frequencies from 23 Hz to 90 Hz. The quasi-steady tests were conducted at Mach numbers from 0.2 to 0.9, and the oscillatory tests between M = 0.2 and M = 0.7. At quasi-steady conditions a limited number of drag measurements was made with a wake-traversing probe. The results of the test are outlined and discussed in Volume I. A systematic tabulation of test results is presented in Volume II.					
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